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ORIGINAL ARTICLES.

PAIN AND ITS THERAPEUSIS.

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What is pain? The question to the mass of suffering humanity would appear absurd. The one who has experienced pain fancies that he knows what it is, just as

> "The primrose by the river's brim
> A yellow primrose is to him,
> And nothing more."

But to the philosopher, and especially to the physiologist, the nature of pain, in common with the nature of all other life phenomena, has a significance unknown to those not given to such analysis.

Consciousness is requisite in pain appreciation as well as any kind of feeling. The suppression or blunting of consciousness notoriously suppresses or blunts pain. The cognizance of pain being a cerebral process involving consciousness, cutting off the route to the brain by which pain is conveyed to consciousness disposes of the pain, but not of the cause originating it. Too many pain alleviators are mere deadeners of sensation. The inebriate "drives dull care away" with his dram, but awakes to a realization of having intensified his troubles by the means adopted to escape them. Schopenhauer holds that pains are positive and pleasures are negative experiences; that pleasures are due to the absence of pain and the intensity of one is often in proportion to the other feeling that preceded. Susceptibility to painful impressions increases with development of the nervous system in the ascending scale of life from lower animals to man and in the ratio of intellectual growth, and enjoyments are correspondingly multiplied and intensified. The pains and pleasures of the intellect are both qualitatively greater with its development.

The major anesthetics act upon pain by extinguishing consciousness in general, other chemicals arrest the pain consciousness alone, and in rare cases ether and chloroform have unexpectedly allowed intelligence to be preserved during the painlessness induced by them, while intermediate states between total and partial abolition of consciousness occur from insufficient anesthesia, to that which is called the surgical degree. Shock to the nervous system is more likely in the former case, and it sounds strange to say that, other things equal, death during an operation is more likely to occur from imperfect than from full anesthesia.

The philosophic claims of pleasure being not only antithetical to pain but due to pain absence, finds justification in the universal prevalence of care, which is essentially a painful state, and the fools' paradise to which the drunkard is conveyed by his anesthetic alcohol. Further, in paretic dementia there are both physical and mental anesthesia; the tactile sense impairment, akin to what is found in locomotor ataxia, is accompanied by the loss of care, indifference to what otherwise would cause grief, or other degrees of mental pain. The consequence is the feeling of well being, *bienfaisance*, and upon this is erected the "delusion of grandeur" which takes the direction of assertions of great wealth, strength, or powerfulness in some form, according to the ideals usual to individuals of different classes.

So paretic dementia and the complacent megalomania stage of paranoia may be put in the category of pathologic mental anesthesias, all the more properly as both disorders indicate impending total destruction of the organ of the mind.

Many bodily functions, such as digestion, assimilation, etc., are unfelt, conveying nothing of their workings to consciousness until some fault in their process render them apparent; induces discomfort, anxiety, or pain.

Interference with customary nerve action may, under certain conditions, be the basis of painful sensations. In all life relations that which occasions the least effort impresses consciousness least. Changes from usual experiences may entail effort, greater expenditure, more labored heart and blood vessel impulses; more heat is evolved, tissues are consumed and require more repair than usual. Mosso shows that thought is no exception to the rule, for blood pressure and temperature are raised in this kind of brain activity, and the wear and tear of cerebral structures in worry, grief, anxiety, can be as actual as from some mechanical destruction such as a tumor or direct injury could induce.

Effort of any kind has in it the constant menace of pain, and relaxation the promise of release therefrom, though inactivity sometimes may also become painful if maintained by effort.

Life itself is activity, whether in rest or in labor. Molecular or mass motion must proceed in varying degrees, asleep or awake, toiling or recuperating. And the law of relativity complicates considerations of activity and inactivity by making effort and rest impossible to classify under all conditions. What would be labor to one person is not such to another. Ease to one individual would be torture to another, and accompanying circumstances may convert what would be pleasure at one time into pain at another.

Pain also is relative, for a certain nervous molecular activity may be over-stimulation in one person and normal in another.

For the proper maintenance of nerve function there must be continuity of the conducting organ, a normal degree of pressure thereupon not to be exceeded; heat above a certain level and within definite limits; a suitable supply of nutritive material usually secured from

the circulation, and that it should be suitable refers to both quality and quantity.

Pain may result from interrupted continuity, from irritation or pressure upon nerves or their centers, from heat or cold extremes and from defective nutrition, provided that the sensory portion of the nervous system is not disabled from conveying intelligence of such changes to consciousness.

Great organic destruction may proceed unrecognized as such until the sensory nervous distribution is in some way apprised; so while pain may in a general way serve to warn of danger, it may fail to do so, or prove unreliable in making a great disturbance over an imperfect tooth while failing to inform the drunkard of the slow destruction of his liver or brain. History also abounds in instances of universal hubbub over trifles and apathy concerning matters of the greatest importance.

Hunger is a form of pain which disappears in the extremity of starvation. One may freeze unawares but suffer acutely during warmth restoration.

Local blood quantity may increase or decrease emotional, intellectual or sensory faculties. Nerve stimulants raise the spirits and make sensations keener. Sedatives diminish mental pain as they do physical. Only broad generalizations are practicable in determining what would be pleasurable or painful, for so many modifying factors complicate both extremes of these sensations that experiences when repeated may fail to act as before, or pain may become pleasure or pleasure pain. And what would afford pleasure to one person may be annoying to others. The color blind and tone deaf persons are merely bored by what others enjoy.

Dean Stanley actually suffered from listening to music, yet Jennie Lind once told Max Müller he paid her the highest compliment she had ever received. Stanley was very fond of Jennie Lind, but when she staid at his father's palace at Norwich he always left the room when she sang. One evening Jenny Lind had been singing Handel's "I Know that My Redeemer Liveth." Stanley, as usual left the room, but he came back after the music was over and came shyly up to Jenny Lind.

"You know," he said "I dislike music; I don't know what people mean by admiring it. I am very stupid, tone deaf, as others are color blind. But," he said with some warmth, "tonight when from a distance I heard you singing that song I had an inkling of what people mean by music. Something came over me which I had never felt before, or yes, I had felt it once before in my life." Jenny Lind was all attention. "Some years ago," he continued, "I was at Vienna and one evening there was a tattoo before the palace performed by 400 drummers. I felt shaken, and tonight, while listening to your singing, the same feeling came over me; I felt deeply moved."

"Dear man," she added, "I know he meant it, and a more honest compliment I never received in my life."

What savages consider musical the civilized could not tolerate, and the untrained ear is wearied by classical music as is the untrained mind by discourse beyond ordinary understanding. For this reason, as Herbert Spencer claims, wisdom always has appeared and always will appear to be folly to the ignorant.

The special sense nerves have been excluded by some physiologists from among conveyers of pain, but blinding light, disagreeable sounds, odors and tastes are analogous to tactile pains, and are induced by over-stimulation or other comparable interruption to the customary nerve workings.

As frequently more than a single factor enters into the creation of pain and its exacerbations, the withdrawal of one of these elements may modify or even relieve the suffering. For example it is told that a professor lectured through his hour unconscious of a cinder in his eye which made itself felt immediately afterward. Referring to the use of derivation such as blisters, hot foot baths, cathartics, etc., in relieving pain by reducing circulation in the painful part, enables the relief obtained by the professor to be explained as blood supply withheld from the point of irritation while the blood was contributing to brain functions.

In paretic dementia and megalomania the false happiness engendered by the brain destruction, and the disappearance of hunger when dissolution is begun, may serve to explain the *spes phthisica*, or hopefulness of consumption, through blunted pulmonary afferent impressions. Thus the reverse of pain accompanies anesthesia, or absence of sensation, and it is the thoughtless who are gayest and freest from care.

Lucretius, Seneca and Homer allude to what modern psychologists call the luxury of grief (Spencer), pleasure in pain (Ribot), and the pleasure of pain (Boullier). There are pleasures derived in some morbid conditions from physical and others from moral pain. Jerome Cardan wrote that he could not endure existence without pain and he resorted to self-torture to secure enjoyment. Krafft-Ebing discusses such flagellants as a recognized type of sexual perverts. The melancholy of lovers (spoken of by an Irishman as "sweet pain"), that of poets and artists is included in pleasureable pains. Spencer ventures the explanation that the feeling is one of pleasure in deserving more than has been received.

Depression of vital functions is involved in ordinary pain. Melancholia is a "psychical neuralgia" according to Krafft-Ebing.

The coupling of pleasure with what is beneficial and pain with what is detrimental, originated with Aristotle, but it is far from being a universal rule, for pain may be far more useful as a life-conserver than pleasure, and the latter may indicate dissolution, while both may be associated in apparently outrageous fashion in pathologic instances.

Susceptibility to pain may persist in spite of anesthesia, though analgesia is a common accompaniment of loss of sensation. In locomotor ataxia anesthesia and the terrible shooting pains co-exist.

Hyperalgesia can be considered as an aggravated hyperasthesia. The zone of irritability parallel to that of anesthesia on the chest of one with spinal cord disease, can be explained by the hyperesthesia being due to central nerve root irritability as a forerunner of the more serious cause of the associated loss of sensation in the adjacent nerve distribution.

If this irritability involved the blood supply reflex of the spinal cord gray matter, pain is intensified and is induced by ordinary stimulation of the implicated nerves.

In a work entitled "Comparative Physiology and Psychology" (1884), I detailed reasons for the existence of what could be called a "nutrient reflex," whereby blood was instantly impelled to localities in the body that had undergone waste through action, and were hence in need of repair. The mechanism consisted in an intimate association of the vaso-motor nerves with the cerebro-spinal nervous system as seen

in the rami communicantes running from the spinal to the sympathetic system of nerves and their ganglia. It is only by introducing nutrient reflexes into consideration of all the higher vital processes that they can be even approximately understood. The regulation of the caliber of blood vessels, the swiftness of the current of blood and the amount supplied to parts in proportion to their needs in such parts, by a harmonious working of the vaso-motor nervous system with the cerebral and spinal, when carefully considered, clear up many an obscure point in nerve and brain physiology and consequently in psychology. Failure of this relationship will also account for pathologic phenomena explicable in no other way.

Thus in hysteria, instead of proper vascular workings, blood is withheld from cerebral centers, giving rise to aphonia, deafness, blindness, etc., and when impelled to inappropriate parts an inversion of the emotional exhibitions may result in pleasant impressions starting the weeping mechanism, and laughter following upon unpleasant impressions.

Cramped vascular and other renal channels sufficiently account for hysteric urinary suppression, and relaxation of these parts induces the copious *urina spastica*, or vast quantities of limpid urine, passed after a hysteric attack.

Ordinary toothache induced by alveolar abscess is lessened by whatever draws blood from the painful part and is increased by hyperemia. The irritation of the carious tooth starts the pain, but the battle of the phagocytes and microörganisms induces an increased blood accumulation, which by mere pressure may intensify the agony. Relief through evacuation of the abscess points to the blood pressure as the aggravator of the pain.

When pain is relieved by a mental impression it can best be accounted for through derivation. Some other portion of the cerebral or other organ drains away the overplus blood, with corresponding relief. Some headaches dependent mainly, though secondarily, upon too much blood, or erratic blood distribution in the brain meninges, can be relieved by whatever will determine blood elsewhere, whether by full or partial hot bath, a mustard plaster, a changed current of thought, or a mental impression. Conversely an anemic headache may disappear upon lying down or by heart stimulation.

That the circulation participates in suffering either as a cause or consequence is readily observable.

Congestion may induce tactile pain, offensive odors, ringing in the ears, flashes of light or perverted taste, according to the nerve distribution affected; the extreme congestion can obtund or even cut off special sense appreciation, inducing anesthesia, deafness, blindness, inability to smell or taste, through pressure, and the opposite extreme of bloodlessness can set up identical defects.

The old saying that "pain is the cry of the nerve for purer blood," is in a restricted sense true. Impure blood may induce pain through acting as a foreign substance and through reducing the quantity of blood proper. Pain may be the cry for less blood also.

Headache from bad air is a toxemia, ordinarily relieved by fresh air. The insufficient oxygenation renders this qualitative a quantitative condition. Headaches caused by tumors, especially the grinding luetic headache, are through meningeal nerve pressure and irritation. Similarly meningitis and injuries to the head that involve the brain and its covering, when inflammatory conditions follow, depend upon the vascular troubles associated with such inflammations. Reducing the blood supply to the head modifies the pain and destructive processes.

Irritation of ordinary sensory nerves suffices to cause pain, as when an amputation stump cicatrix includes a nerve and neuromatous growths are formed. That the circulation contributes to the pain is evident through the desire to elevate the stump and by gravitating the blood therefrom allay the suffering.

Normal irritation of nerves produces the feeling of general comfort, free breathing, and tactile impressions generally. Hunger, thirst, malaise, horror, fatigue are due to nerve terminal irritation. Mechanical, chemic, thermal and electric stimulation may cause pain if transcending certain limits, or if intense enough may destroy sensation altogether, and beyond this the *anesthesia dolorosa* may appear. Pains are not always definitely located, through irradiation, or may be referred to the wrong source of origin, as when amputation pains are felt to be in the lost member.

Varieties of pains are in proportion to the intensity of the stimulus, and massiveness regards the number of nerves involved.

Most of the differences described by the words piercing, shooting, cutting, boring, burning, pressing, gnawing and acute, are due to the intermittent or continuous molecular changes in nerves or their centers, but the throbbing and dull pains usually owe their peculiarities to arterial or passive congestion. The headache known as angio-paralytic has been often relieved by pressure upon the carotid supplying the aching part and the angio-spastic kind should be treated by means calculated to relieve spasm, such as amyl nitrite inhalations. In the one case there is the hyperemic throbbing arterial impulse, and in the other intense constriction of vessels inducing localized anemic pains.

In inflammatory affections of the skin hyperalgesia may be so extreme that a breath of air or light touch produces pain. The blood superabundance in the nerve terminals here is plainly the cause.

The disordered sensations called paresthesiæ including chills and burnings, creeping, itching, formication, are related to pains, and may become so intense as to become such. Causalgia and erythromelalgia are described by S. Weir Mitchell as burning sensations and reddenings due to central nerve irritations.

Neuralgias, with shooting pains transmitted the length of the nerve affected, primarily or secondarily involve blood distribution, and inflammation of nerve roots frequently give rise to neuralgias. The inflammation may not be the cause of the original disturbance, but even though produced by the same irritation that induced the neuralgia it is an aggravating factor, and when this inflammation is controllable a step toward possible cure is taken.

The structural commotion recognized as pain can only be maintained by blood presence, as nutrition is necessary for prolongation of any vital phenomenon.

When the vascularity of a point of irritation, such as the amputation end of a nerve, is relieved of blood supply by gravitation or pressure the pain is lessened. Anesthesia often accompanies bloodless peripheral states and the numbness of freezing depends upon the constriction of blood vessels and other circulatory reduction in the frozen part which visibly whitens through being deprived of blood.

Inflammation of a spinal nerve root or in the sensory neuroglia of the spinal cord causes the lightning pains of neuralgias, ataxia and sciatica. Relief of the inflammation necessitates more than mere temporary alleviation of the pain, for the primary cause of the irritation that induced the inflammation must be reached, and a destructive process in the nerve centers from chemic changes is too often beyond control.

Among painful states associated with too much engorgement of nerves or their centers are all the hyperemic, congested or inflammatory cerebro-spinal disorders, such as some headaches, toothaches, neuralgias, ataxic pains, overheating, hyperalgesias and hyperesthesias.

The opposite condition of relative bloodlessness occurs in cold, hunger, thirst, fatigue, pressure, anemic headaches and other painful states depending upon reduced blood volume.

Blood poisoning by alcohol, septic matter, gases, etc., while qualitatively altering the blood for the worse, reduce the quantity of pure blood to parts and act as anemic factors, while the foreign substances "irritate" the nerve centers. Uric acid crystals mechanically cause pain in the kidney tubules, ureters and bladder, and may reasonably be regarded as sensory disturbers elsewhere. Sodium urate deposits in the joints exert painful pressure.

In all these phases of suffering we observe an irritated part of the nervous system, bloodlessness or engorgement, associated with the pain, either as cause, effect or added factor.

A toxic substance circulating in the blood whether introduced from without or manufactured in the body, if denied proper elimination, as often takes place with uric-acidemia or other auto-intoxication, may irritate the vascular nervous control so as to produce contracted arterioles with increased arterial tension, a spastic condition observable in migraine and to an extreme in the frightful *raptus melancholicus*.

In these disorders, irritation primarily and relative anemia secondarily, are at the foundation of the suffering, while as a consequence engorgement of other organs or parts of organs complicates and adds pressure, or congestive pains.

Over-stimulation of nerves often produce over-stimulation of the circulation, or even its practical paralysis, with localized hyperemia and resulting pain.

In short all painful states may include the conditions of irritation, too much or too little nutrition, separately or combined, in various ways. These pain factors may be symbolically represented by the initials of irritation, hyperemia, anemia, to graphically illustrate pain, however induced:

Uric acid headache: I. A.; the irritation causing the anemia.

Chlorosis headache: A. I.; the anemia causing the irritation.

Cerebral congestion: H. I.; the congestion causing the irritation.

Over-stimulation: I. H.; the irritation causing the hyperemia.

These three conditions may be combined simultaneously or successively to produce very many apparently discordant pathologic states. Anemia in one part, however induced, may result in congestion in an adjacent part, and the pressure hyperemia may cut off nutrition from surrounding points so that both hyperemia and anemia may occur in closely related parts, each condition adding its special irritative influence to the total pain; so the localized pain may have the formula I. A.; I. H.; I. H. A. within a narrow area, or either H. or A. may cause I., and, further, the combination I. H. A. may set up intensified irritation; the withdrawal of one factor serving to lower the pain intensity and paving the way to removal of the entire pain.

Let I. be induced by an exposed nerve, H. follows with may be A. in contiguous parts by pressure of blood; now while the removal of H. by blood evacuation may reduce the aggravating influence of blood pressure, which acts irritatively, the most sensible thing to do is to get at and remove the primary cause of the pain by protecting the nerve from exposure which sets up the hyperemia. If an abscess results from the phagocytic battle the septic advance adds further irritation, which must be disposed of in attempts to remove all causes of pain.

A general blood condition may favor the production of pain by having within it the elements of disturbance ready to centralize upon a weak point. Analogous sociologic states exist. Peter the Hermit and Walter the Penniless were foci of irritation in the eleventh century, leading up to the crusades in which two million Europeans were slain in two centuries. This blood letting finally carried off the disturbers and the disturbed, and, therapeutically, venesection has for ages been resorted to in pain relief, though derivation or the transfer of the disturbed circulation is nowadays preferred.

A point of irritation may be starved out by keeping nourishment reduced, it may be evacuated at the expense of the blood, or it may be held in check by removal of the elements that nourish its fury, or, best of all, the focus sometimes may be directly destroyed by medical or surgical means.

Far too often this latter process is impossible through inability to determine at the proper time just where or what the primary disturbing influences may be, or even if determined there is in most cases inability to get at and remove the origin of the pain. But the safest rule to adopt is to attempt to do so if within possibility, and where relief of pain is imperative with no practical means of removing the cause only such agents should be resorted to that do not entail other and often greater disadvantages to the economy, sooner or later.

Only such portions of the body as are supplied with sensory nerves relate consciousness to pain. Irritation of unsupplied parts may advance to various forms of destruction and until the sensory filaments are secondarily involved by extension, or through accompanying circulatory alterations, the warning which pain is supposed to afford is absent.

Several of the recently discovered synthetic compounds combine antipyretic with analgesic properties in different degrees. Acetanilid, formerly known as antifebrin, has been too recklessly used. It depresses the heart dangerously and requires careful watch of its physiological effects. "Antikamnia" (Helbing, Modern Materia Medica, page 3) has been found to contain acetanilid, sodium bicarbonate, caffein and tartaric acid. In many such advertised preparations the possible introduction of acetanilid should be regarded. Even external application of acetanilid, as has been suggested for antiseptic purposes, is dangerous. Pseudo-scientific compounds, mainly with acetanilid mechanically mixed with other substances,

can be avoided by learning the status of their originators, manufacturers and clinical reporters.

Antipyrin is incompatible with too many materials to enable its administration in combination with ordinary remedies. Cesari's claim that it thickens and condenses the blood without coagulating it may account for its hemostatic properties and should be regarded in a study of its antineuralgic, antipyretic and other influences. Exalgin is too poisonous for analgesic use. Methyl chlorid as a spray produces local anesthesia through freezing the part to which it is applied. The visible whitening of the surface that occurs during its application indicates that bloodlessness is the cause of the sensory arrest. Paraldehyde is an unreliable sedative or hypnotic. Phenacetin or phenocoll have been successfully established as sedatives and are far safer than acetanilid or antipyrin. The salicylates and salol possess indirect slight analgesic properties, due to their antiseptic and anti-rheumatic tendencies, and dilute carbolic acid blanches animal surfaces and produces local anesthesia. Cocain hydrochlorate likewise reduces blood circulation at the point of local anesthesia. Its fascinating temporary euphoria and later excitation of nerve centers are worthy of study among psychologic effects of drugs.

Opium and its congeners are responsible for legions of debauched habitués, most of whom date their addiction from incautious prescribing. The benumbing influence of alcohol and opium upon the nervous system generally account for their exhilarant influence, on the principle of mental anesthesia inducing relative exaltation; the relief from care, concern and painful memories being subjectively interpreted as happiness. The debased sensory apparatus of the paretic dement causes him to insanely ascribe his bouyancy and general good feeling to greatness or good fortune realized.

Drugs that depress the motor apparatus mainly, such as conium maculatum, do not exalt the sensory field, rather the reverse, but many degrees of association between anesthesia, analgesia and exhilaration are observable in other neurotic medicines.

Opium primarily relieves pain, raises the spirits, then stupefies. Alcohol anesthetizes, exalts and ends in stupor. Chloral may benumb the nervous system, mildly exhalt, then stupefy. Chloralamid, a much safer article, is mildly sedative, causes hypnosis, and the day following large doses a feeling of exhilaration is reported. Chloroform and ether excite, and finally obtund consciousness. Oxygen gas exhilarates. Nitrous oxid gas first exhilarates, and then affects consciousness. The bromids depress the circulation, are mildly analgesic, and in over-doses stupefy. Ergot by constringing overloaded blood vessels may secondarily act as an analgesic.

Phenacetin and phenocoll have greater analgesic properties, while being vastly safer in practice. Acetanilid and antipyrin possess varying degrees of pain relieving power.

Lactophenin is destined to largely supersede the entire array of analgesics proper, owing to its non-toxic peculiarities and the feeling of comfort described by many physicians as following its use. It is also antipyretic definitely, and being without the heart-depressing effect of the older antipyretics it will come into still more extended hospital and private practice administration.

It has occurred to me that the physiologic chemistry of materia medica could be appreciably advanced by tabulating the effect of graded doses, particularly of the recent synthetic compounds, as to when the sedative, antipyretic, antiseptic and hypnotic effects, if any, ensued, juxtaposed with their rational chemic formulæ, their relative looseness or closeness of molecular construction and affinities, with their relations to temperature, solubility, etc. The rapidity or slowness of compounds to enter into new combinations under the conditions afforded by the bodily organs has greatly to do with the therapeutic effects. Antipyretic influence can be exerted through action upon the blood vessel tonus or the blood corpuscles, and in some instances upon the thermal brain centers demonstrated by Ott.

Antisepsis can be conceived in such preparations as acting directly upon septic material or so modifying their products or the vital fluids as to lessen septic activity. Antagonism to fermentation is often practically antisepsis.

Analgesia can result from the direct influence of antiseptics upon irritative points susceptible to their influence; from allaying some consequence of irritation such as an accelerated circulation which aggravates pain, and if pain is due to circulatory faults mainly or wholly this effect upon the heart, arteries, or blood tends to relief. The visible change in the blood materials claimed by Cesari when antipyrin is given can readily be tentatively assumed as a cause of heat reduction, and incidentally pain alleviation.

The rush of phagocytes to an irritated point is accompanied with accumulation of red blood corpuscles. Pain can not continue without the material that enables molecular activity, and this material is afforded by the blood and lymph. Drive away congestion and though the cause of the irritation may remain, its influence is lessened greatly, and the warrior wandering cells have better opportunity to attack the foreign material unless they also are driven from the field of battle.

The pain of a "bone felon" is modified by holding the hand aloft; the Esmarch's bandage anesthetizes by blood deprivation; freezing anesthetizes similarly. Derivation may not be the means by which a disorder can be cured, but when blood accumulation in an organ is pathologic its distribution at least facilitates recovery.

The properties of lactophenin and its superior claims to the attention of physicians where a reliable and non-poisonous analgesic, antipyretic, and incidentally hypnotic, is needed, may thus be summed up from the vast number of favorable clinical reports.

It affords the best results with the least ill effects; it gradually reduces the temperature and for a longer time; occasionally the reduction is more rapid, but controllable.

The analgesic dose of 8 grains has no noticeable effect on the temperature.

Its range of incompatibility is less than other synthetic compounds such as antipyrin. It is combined with caffein, quinin and salicylic acid by some practitioners. The minimum dose is 5 to 10 grains and during the day as high as 45 grains have been advantageously given in divided doses, according to the physiologic effects desired.

It is but slightly soluble in water, but as there is no disagreeable taste it can be given dry and be washed down with a drink of water. Notwithstanding its insolubility it acts promptly. A dose

of 15 grains usually acts as a gentle hypnotic. Cyanosis of lips and face attending occasional overdosing with acetanilid, antipyrin and sometimes phenacetin, does not occur when lactophenin is given, as it never produces heart or respiratory disturbances, dyspnea or collapse. The breathing and circulatory rate are unaffected except that the pulse becomes fuller and stronger, the reverse of the influence of the dangerous antipyretics. The nearest approximation to any unpleasant effect has been a slight faintness and moderate sweating, observed by a few physicians, while there is a general agreement among authors on the subject, that lactophenin not only relieves pain but adds a soothing, comforting feeling, sometimes ending in an agreeable slumber, without giddiness or uneasiness at any stage.

The unpleasant subsidiary effects of phenacetin are absent from lactophenin. Six grams daily have been used when indicated, though 3 grams *pro die* are mentioned as a maximum dose. Vomiting and exanthemata are not generally recorded as observed in using lactophenin. One writer says that it rarely induced vomiting and another mentions a rash in one or two cases. Children of 2 years of age require about one-eighth the adult dose and at the age of 14 about one-half that quantity.

The soothing influence, accompanying relief from pain, caused by lactophenin is described as "a calming effect in restlessness or delirium," "specially calmative of the nervous system in typhoid fever," "a pronounced soothing effect," "a calming hypnotic effect," "a feeling of comfort and ease." It also diminishes sensitiveness to painful impressions.

Experimental doses given to rabbits "annulled sensation and voluntary movements and lessened reflex excitability without respiratory or heart affection."

Von Jaksch mentions lactophenin as useful in typhus, others found it decidedly beneficial in articular rheumatism, insomnia, occipital neuralgia, frontal headache, the headache of typhoid fever, migraine, neuralgic pains generally, pneumonia, erysipelas, influenza, polyarthritis, scarlatina, sepsis, sciatica, headache attending round gastric ulcer, headache and sleeplessness in Bright's disease, bronchitis, acute gastritis, diphtheria, measles. It is reported to have relieved megrim and nervous headache in twenty minutes, and that in one to two hours after 15 grains were taken a quiet sleep began which lasted several hours. In croupous pneumonia the breathing improved, the cough of phthisis florida was lessened, an excited patient became calm and felt easier and better. It has been substituted for salicylic acid with advantage and reduced pain and swelling in twenty-four hours.

Personal observation enables me to corroborate the findings of other physicians as to the superior analgesic and antipyretic effects of lactophenin, its safety and promptness of action. The lancinating pains of locomotor ataxia and the suffering of syphilis of the spinal cord were not influenced by the remedy, nor could it be expected to avail much, if any, in cancer pains, but in all instances of pain attending acute disorders such as make up the generality of cases where analgesia is desirable, lactophenin has given better results than other synthetic compounds of the same group. Toothache from alveolar abscess was relieved long enough to secure a good night's sleep, and at the same time when the 15 grains of lactophenin was taken a fretful baby was being nursed, which also slept unusually well the same night. Hoping that it might serve as a substitute for the bromids in the treatment of epilepsy, while my trials are not concluded, the results are negative. A hot bath or massage serving to distribute the circulation, catharsis that unloads the congested intestine and vascular system, even a hot foot bath, through derivation, has relieved headache, earache and even toothache. It is the withdrawal or minimizing of blood from the painful area that serves to allay if not remove the suffering.

When the professor referred to, set his cerebral machinery in motion so that his brain required blood and withdrew it from the optic that was being irritated by the cinder, the pain was absent until the lecture was concluded. Similarly, the seat of consciousness can be affected by hysteric, erratic blood-vessel action, so as to produce or terminate pain and paralysis through mental influence, and the pain suppression occasionally accomplished under hypnotic conditions is undoubtedly of this nature, and the seat of consciousness may, through derivation of blood by physical or mental action, be similarly affected. The operation of the nutrient reflexes in connection with every nerve impulse should have careful regard by physiologists, and many a mystery would be thus disposed of. The association of antiseptic properties with the analgesic and antipyretic in so many of the phenetidin compounds is also worthy of consideration. If such antisepsis is secured through a direct action of the medicament upon living plant and animal microörganisms, within the varying degrees of arresting or destroying their vitality, analgesia likewise could ensue from chemical lowering of nerve function, directly or through blood changes such as occur with antipyrin.

So it ceases to be remarkable that a substance hostile to minute organisms, an antiseptic, should also act as an antipyretic and analgesic by chemically exerting control over such vital operations as heat and pain production of higher organisms. These lessened molecular activites are exerted in different degrees by the different compounds; some are too strongly antiseptic to be safely used as analgesics or antipyretics; nevertheless the three properties are connected, notably in the case of carbolic acid, and to a safer therapeutic extent in the phenetidin derivatives. Both acetic and lactic acids are oxidized in the body to form carbonic acid, but isomerids of lactic acid exist in many tissues of the body and are products of muscle action. All acids lessen muscle irritability, and ethiden lactic acid has been found as a normal constituent of brain tissue in the proportion .05 to 100. The displacing from phenacetin of the acetic acid constituent by lactic acid, in the conversion of the phenacetin base into lactophenin, introduces an anti-ferment of a physiologic product, a recognized auto-antiseptic, elaborated in higher animal life in place of an acid such as acetic, which is more of a by-product in the economy. The lactic acid combination is more likely to meet physiologic needs than acetic acid when united with a phenetidin base.

70 State Street.

Ichthyol Administered Internally in Certain Gynecologic Troubles.—Günsburg has found ichthyol administered according to the following formula of the greatest service in chronic affections of the genitalia, with reflex disturbances of the digestive system: Ichthyol 4 grams, licorice extract and powder q. s. Mix and divide into forty pills; take two pills three times a day. He has them keratinised. Dyspepsia, constipation, abdominal pains and menorrhagia are rapidly improved or cured with it. —*Semaine Med.*, December 30.

SURGICAL DISEASES AND INJURIES OF THE NECK.

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It is here assumed that the student of regional surgery is possessed of the knowledge of the general surgical diseases, *i. e.*, those diseases which may be observed in any other region, and the descriptions will be limited to the peculiarites only which those diseases present when they affect the neck or one of its regions, thus avoiding repetition as much as possible. If no peculiarity is mentioned in regard to diagnosis and treatment it is because they are the same as for the diseases in general.

This study is divided into that of the diseases and injuries of the neck as a whole and that of the dieases and injuries of its seven regions: The infra-hyoid (including the thyroid body, the supra-sternal fossa), the supra-hyoid, the lateral supra-hyoid (or digastric triangle or submaxillary region), the parotid, the lateral region (or region of the sterno-mastoid, or of the carotids), the supra-clavicular and finally the posterior region.

The following order will be followed in the descriptions: Malformations and swellings, injuries, neuroses, softenings, indurations, congestions, inflammations, gangrenes, ulcers, fistulæ, tumors.

SURGICAL DISEASES AND TUMORS OF THE NECK IN GENERAL.

Congenital fistulæ of the neck are due to arrest of development or lack of fusion of the branchial laminæ or folds and clefts of the pharyngeal fissure; they are sometimes hereditary, but are sometimes discovered only a long time after birth; they may be due there to a cyst which has ruptured externally; they are usually very small, seldom admitting more than a ease probe, exceptionally the end of the little finger. The external orifice is situated most commonly on the right side of the neck in front, and behind the sterno-mastoid, and between the thyroid cartilage and the sterno-clavicular articulation; sometimes, but rarely, at the angle of the jaw; it is sometimes on a projection, at other times in a fold of the skin; it occasionally presents cartilaginous or osseous particles; it may be found blocked by the dried secretions. These fistulæ resemble congenital tracheal fistulæ, but the latter open commonly on the middle line; they are more rarely found on the side and still more rarely on both sides. The internal orifice may open into the pharynx or larynx or trachea; it is observed almost always near the tonsil and base of the tongue, and is very small; it may become the starting point of serious inflammation and abscess. When they are complete an injection of milk penetrates the pharynx or the larynx. These fistulæ may be external blind or internal blind; the external blind are by far the most frequent. The course of the fistula is marked by a cord-like tract which corresponds to the track of the fistula; its direction is straight or tortuous, oftenest in the direction of the great horn of the hyoid bone; it is constituted by an external thick, fibrous coat, which forms the cord and is lined by a sort of mucous membrane which secretes a thin, viscid fluid containing epithelial cells, or is purulent. Internal blind fistulæ are very rare, but it is positively known that they exist. They present the variety called diverticula "by pulsion" of the pharynx and esophagus, due to the dilatation and development of an originally small pouch under the influence of the accumulation of the food; they sometimes form very large tumors. The diagnosis of congenital fistula rests upon the secretion of the fluid, the presence of the cord, the penetration of the probe and the injection of colored fluid. Congenital fistulæ are almost always stationary; they are more a deformity than a disease.

Treatment is usually unnecessary, and fortunately so, because it usually fails when limited to stimulating injections; dilatation or curetting and excision is a laborious operation, not without danger and scarcely justified by the inconvenience experienced. Both orifices may close and leave an intermediate tract.

Congenital atrophy of the whole or more or less extensive parts of the neck is very rare without participation of the rest of the body.[1] The *congenital pigment atrophy* called *vitiligo* is rather common on the neck. Other skin atrophies are very rare. *Congenital atrophy of the sterno-mastoid* has been observed. *Congenital atrophy of the other structures of the neck* have not been observed.

Congenital hypertrophy of the whole neck has never been reported; neither has partial congenital hypertrophy apart from the congenital cysts and tumors. *Congenital hypertrophy of the constituents of the skin or of the tissues* of the neck has been reported; congenital hypertrophy of the thyroid body and of the thymus gland will be studied in their proper places. *Congenital deviations* have been observed, due to malformations or diseases of the vertebræ.

Acquired malformations of the neck.—Acquired *atrophic malformations* are observed here as the result of injuries, diseases, operations, cicatrices, as in cases of torticollis.

Acquired hypertrophic malformations of the whole region is noticed; a short neck is considered as a predisposing cause of apoplexy. Hypertrophy of the whole neck is observed in elephantiasis and myxedema. Acquired malformation of the skin and of the other structures of the neck present no specially interesting points.

Acquired deviations or asymmetries are seen, especially after burns and cicatrices and after torticollis or paralysis. Cicatrices are due to burns, wounds, abscesses, gangrene, ulcers, fistulæ; they are unsightly and often cause impairment of function; the skin may be bound down to the sternum; they excoriate easily from traction by the involuntary movements of the parts, and in that case they should be excised and sutured if small, but grafting or autoplasty should be resorted to, to prevent their reproduction if they be large.

Swellings of the neck.—Swellings of the whole neck are common; their causes are numerous; they may follow injuries, inflammations, tumors, operations. Their common feature is the great danger from the propagation to the aryteno-epiglottic folds, causing obstruction of the larynx and pressure symptoms, specially dyspnea, which it is often impossible to relieve because of the difficulty of reaching the trachea. If an attempt is deemed justifiable the operator should be provided with an extra long tracheal canula.

Softenings of the neck present nothing peculiar.

Indurations are represented by the peculiar indurations of the sterno-mastoid, which will be described with the diseases of the lateral regions of the face.

[1] We may recall here, however, the naturally long and slender neck of the unfortunate Anne Boleyn, who remarked that her neck would not give the executioner much trouble to sever.

Injuries of the neck.—*Burns* are here particularly serious on account of the swelling and the edema of the larynx, which may complicate them. Even when no deeper than the skin they result in cicatrices which are most deplorable because of the appearance of the parts and because of the deviations they cause, sometimes binding the chin down to the sternum; for this reason they should be grafted at the earliest possible time. Deep burns extending to the muscles and to the vessels are most serious, even when limited, for obvious reasons. The cicatrices pass into keloids oftener than in the other regions.

Contusions are not frequent, they are usually produced by falls, blows, hanging, garotting, throttling, passage of a wheel over the neck, or by the pressure of the dislocated clavicle. A blow on the side of the neck is a great aim with pugilists, because it is almost a sure knock-down or knock-out; it is often in its results grave, because of the importance of the organs of the neck, and may be accompanied by fractures of the hyoid bone, larynx and trachea; injuries to muscles, vessels, nerves, pharynx, esophagus; vertebral lesions, concussions and contusions of the spinal cord;[2] hematoma may form and become large and cause grave pressure symptoms on all the structures. Death may occur after a few days from edema of the lungs; also from embolism from one of the large vessels of the neck.

Wounds of the neck are comparatively rare in civil practice; sometimes they are accidental and due to a fall on a fragment of glass, a stem of iron or wood; they are most commonly due to attempts at murder or suicide; the suicidal are the most common and the most interesting.[3] Superficial or extra-fascial wounds of the neck, *i.e.*, wounds not extending beyond the superficial cervical fascia, present nothing peculiar. However, a large incised wound of the external or anterior jugular, especially if these veins happen to be unusually large, may give entrance to air. In tracheotomy the anterior jugular is often wounded; also the inferior thyroid veins. If the parallelism of the lips of the wound has been disturbed, there may be much infiltration of blood; this requires enlargement of the incision and ligation in preference to pressure; cellulitis spreads rapidly. Gunshot wounds are rare, yet there are instances when a bullet has traveled under the skin and above the fascia without penetration of the fascia. Contused and lacerated wounds, if extensive, may be followed by cicatrices and their consequences.[4] Gunshot wounds causing much destruction of skin present the same remarks as the lacerated wounds. Deep or subfascial wounds[5] are almost all very serious because of the almost constant injury of some of the large vessels and nerves or of the special organs of the neck, larynx, trachea, pharynx, thyroid body, giving passage to air, food, blood, each of which call for special treatment. Complications of the wounds of the neck are the following: thrombus or extravasation of blood, due to the loss of parallelism of the lips of the wound through the various layers; entrance of air in the veins, more frequent and dangerous here than anywhere else; passage of food through the wound and into the larynx or trachea; hemorrhage more or less profuse according to the vessels injured and its accessibility; emphysema, due to injury of some point of the respiratory tract with a gravity greater than in any other region on account of the involvement of the aryteno-epiglottic folds and the consequent obstruction of the larynx; aphonia from injury to the vocal cords or to the nerves; emphysema, edema, penetration of blood in larynx, or injury of the pneumogastric or laryngeal nerves; dyspnea due to the same cause plus injury to the phrenic; dysphagia, due to swelling or pain; erysipelas is a frequent complication; also pyemia or sepsis; edema of the glottis is very common; spasmodic croup due to pressure or to nerve injury, is not rare; concussion of the cervical column communicated to the spinal cord, to the pneumogastric, phrenic, cervical plexus, brachial plexus, have been observed in severe wounds.

The symptoms of entrance of air into the veins are a wind-sucking or gurgling sound, immediate pallor of the face, dilatation of the pupil, irregular or tumultuous action of the heart, embarrassed breathing and death. The wound should be plugged at once with the finger, and all the usual means of resuscitation vigorously and persistently applied. The amount of air introduced is a grave factor. If the wound be small, the operation may be continued by keeping it constantly filled with warm sterilized water.

The sequels of the wounds of the neck are: permanent aphonia or dyspnea or dysphagia, necrosis of the cartilages and of the hyoid bone, torticollis due to contraction of cicatrix, to inflammatory adhesions of the muscles or to nerve injury; fistulous tracts; granulations obstructing the respiratory tract.

Deep punctured wounds striking the large vessels are those which are most commonly followed by deep and extensive extravasation and traumatic aneurysms; they call for the ligation of the two ends of the wounded vessels; it is here that a proximal loop ligature of the main trunk, low down when practicable, will be of the greatest assistance in controlling the hemorrhage during the search for the bleeding ends. They are also more commonly followed by emphysema than the incised wounds. When they involve a nerve they may cause tetanus or spasmodic croup. Deep incised wounds are often rapidly fatal from the excessive hemorrhage, because it is rare that some artery or vein has not been opened; the same foregoing remarks apply here as to their treatment. Deep contused and lacerated wounds present here no special peculiarities not covered by the above descriptions and the description of these wounds in general. Gunshot wounds usually cause much hemorrhage; they sometimes recover most unexpectedly; of course their gravity varies with the injuries inflicted. When the ball is deeply seated, no dissection should be made to extract it until later if it produces disturbances. Foreign bodies in wounds of the neck are common, wadding, pieces of clothing, piece of the weapon or bullet.

Fractures of the neck are rare; their description belongs to another chapter.

Dislocations, also *sprains*, are the result of injuries in which the head is much stretched, most commonly and especially when violently striking an obstacle vertex first; they give rise to great pain, particularly when the head is thrown backward. The treatment consists in thorough rest of the part by lying on a bed or by applying a liquid glass bandage.

Poisoned wounds, i.e., bites, stings, are more fre-

[2] They are usually due to a fall, the passage of a cart wheel, the stroke of a stick, a fist blow; to the pressure of the dislocated clavicle.

[3] The wounds are penetrating or non-penetrating according to whether or not they reach the trachea or the esophagus or the vessels.

[4] Gunpowder stains should receive as especial attention as for those of the face, especially in the exposed parts of the neck.

[5] That is wounds, extending beyond the cervical fascia and more or less deeply.

quent on the neck on account of its exposed condition; also more grave, because no clothing has protected the parts; also, because they are usually followed by great swelling, which reaching the aryteno-epiglottic folds, causes obstruction of the larynx. Bites of a rabid animal are more serious because they have a shorter distance to travel to reach the central organs of innervation and because no clothing has wiped the animal's teeth. In all injuries of the neck causing obstruction to the free circulation of the air, from whatever cause, there is great dyspnea, cyanosis, anxiety; the pulse is full, rapid; there is also aphonia, dysphagia, pain. Tracheotomy should be performed; it is often advisable not to wait for very urgent symptoms to have the operation performed, because death may come on rapidly or suddenly before the patient can be reached.

Surgical neuroses of the neck, i.e., paralysis, spasmodic affections, retractions, neuralgias are rare except those which affect the sterno-mastoid and the trapezius and which will be described in speaking of the various forms of torticollis.

Hyperemia or congestion of the neck often accompanies that of the face, but it seldom exists alone.

Inflammations present most important differences according as they are superaponeurotic or subaponeurotic. Inflammations of the skin proper present nothing peculiar except that erysipelas seldom originates there; it is usually an extension of erysipelas of the head; it is seldom that erysipelas affecting the head will not extend to the neck, and it is also rare that it extends beyond and reaches the trunk. Furuncles and carbuncles may be serious by their extent and by the swelling they cause, which may extend to the epiglottic folds and cause obstruction of the laryngeal opening. Malignant pustules are most common on the neck; the swelling which accompanies this affection is an added danger here if it extends to the aryteno-epiglottic folds. Superficial or superaponeurotic cellulitis is serious only when diffuse or extensive and for the same reasons as given above. When a superficial abscess forms and has to be opened, care should be taken to avoid the anterior and the external jugulars, because they are always pressed toward the surface close to the skin. Deep or subaponeurotic cellulitis is a very grave affection, because of the compression due to the swelling and because these symptoms are increased by the unyielding nature of the fascia. It may be primary, the result of cold, or secondary due to some injury or some lesion of the teeth, especially of the wisdom teeth, bones, lymphatics, thyroid body, scalp, ear, face, mouth, or to low fevers. It may come from neighboring organs; tonsillar abscess sometimes opens under the inferior maxilla, and deep axillary abscess in the supra-clavicular region, as does also anterior mediastinal abscess. Primary cellulitis and abscess may be due to wounds external or mucous, to fractures, to osteo-periostitis, to osteomyelitis of the inferior maxilla, to phosphorous necrosis of jaw, to submaxillary adenitis, to thyroiditis, or acute hygroma of the serous bursae of the neck. Most of these acute inflammations are really adeno-cellulitis, due itself to lesions of all kinds of the face and neck, superficial and deep. Sometimes the initial lesion is very small and insignificant; often the gland itself does not suppurate but the connective tissue around it does (peri-glandular connective tissue); this adenitis may involve the following ganglia: submental (or digastric, or supra-hyoid), infra-hyoid along the middle line (juxta-laryngeal, sterno-hyoid, laryngo-pharyngo-esophageal). In general diseases (diabetes, typhus, pyemia, typhoid fever, measles, variola, diphtheria, especially scarlatina) these inflammations appear most commonly toward the end of the disease or in the convalescence, and are more frequent here than anywhere else and call for special stress on some of the general features. The microörganisms met with vary much; beside the ordinary agents of inflammation we may meet with the micrococcus tetragonus, bacilli of typhoid fever, encapsulated diplococci from pneumonia; it is difficult to say which of these microbes are simply phlogogenous or also pyogenous. In abscess from dental caries spirilla of saliva have been met. Actinomycosis may cause cervical abscesses, although the organism lives specially in the mouth, in tonsillar depressions, in diseased teeth particularly; they may produce metastatic abscesses in the brain, thorax, abdomen; these abscesses are usually multiple and usually run an insidious and chronic course. Abscesses following injury or scarlet fever sometimes form a hard mass, slow in suppurating, causing great damage; sometimes they bleed alarmingly when opened, even after they have been opened several days, on account of sloughing of the vessels; they may be accompanied by thrombi in the large veins or sepsis. When the cellulitis suppurates the abscess may be circumscribed or diffuse; the pus may fuse in the chest, in front of the thyroid and sternum (previsceral route), behind the pharynx and esophagus (retrovisceral route), or along the carotid and jugular vessels in their sheath or in the sheath of the nerves of the brachial plexus behind the sterno-mastoid, reaching the supra-clavicular region and the axilla; it may open into the pharynx, esophagus, larynx or trachea, pleura, or mediastinum. Retro-pharyngeal abscesses may be limited; then they project on the sides of the neck in the maxillo-pharyngeal space; when they are median they can be reached through the mouth. In some subacute cases in the upper cervical region and at the root of the neck abscesses have a tendency to become encysted, and finally open on the skin; they may be chronic. When an abscess is near or over the cystoid, it pulsates, but then there is no expansion

Chronic abscesses are oftenest due to a constitutional cause; sickly children with bad hygienic surroundings are the most common sufferers; they often start in the glands or bones or cartilages. A residual abscess is one due to the revival of an old cured inflammation. Chronic abscesses sometimes present multiple openings or sinuses; they sometimes ulcerate and perforate the arteries and veins. Scrofulous adenitis has the neck for a seat of predilection; the acute form is very rare; it is more special to adults; when the swellings are established the course is often slow. Simple chronic adenitis is very rare, it is very often scrofulous but not always inflammatory; they are due to repeated pharyngitis or carious teeth.

En résumé, the most common causes of cervical cellulitis are dental affections, lesions of the face and mucous membrane of mouth and pharynx; diphtheria and especially scarlatina; hence the great frequency in children and adolescents.

Diffuse abscesses are rare on the neck; they are sometimes gangrenous, they are often the result of a bad general condition, or of a badly treated circumscribed cellulitis. The peculiarities of cervical cellulitis are that sometimes they are very extensive and the general symptoms precede all the local signs of

deep cellulitis; usually they all suppurate; also they often cause cerebral anemia due to the compression of the carotids or to the coagulation of the blood in the compressed artery and vein.

The diagnosis of deep abscesses, especially of the acute abscesses, should be made at once by using the exploring needle and syringe, not a hypodermic needle, which may not give passage to thick pus, but a needle at least twice as large as the ordinary hypodermic needle. Exploration should be repeated every second day if necessary.

The treatment is evacuation and drainage, but in these dangerous regions fear of wounding important structures often holds the surgeon's hand when the abscess is one or two inches deep, until it becomes more superficial. By incising on the middle line and going around the trachea the knife can penetrate deeply with safety; also by incising behind the posterior border of the sterno-mastoid, or along the base of the jaw. It is recommended by some to cut down and ligate the vessels as they are divided, but when these are imbedded in indurated tissue this is almost impossible. Others leave the needle in place and cut down along it, but the divided vessels present the same dangers and difficulties. Hilton's method is to use the knife only to start, and as soon as deep parts are reached to tear with the director and use dressing forceps to dilate the small entrance gained into the abscess; it offers the same objections. The writer calls his method guided dilatation; it consists in the following steps: As above described, use a proper needle to locate the pus at the depth of one, two or three inches; unscrew the syringe and leave the needle in place; introduce through the needle a steel wire seven or eight inches long until it reaches the bottom of the abscess; remove the needle, leaving the wire in place; make a small incision through the skin to overcome the only serious resistance to the introduction of the dilators; take a trocar (with canula) of one-eighth of an inch in diameter, perforated from point to handle, and run it over the wire into the cavity of the abscess; it penetrates by dilating the tissues by the three blunt edges of its prismatic triangular point; then remove this trocar, leaving the wire still in place; take a trocar and canula of three-sixteenths of an inch and introduce it likewise along the wire; withdraw the second trocar and insert in a like manner one of a quarter of an inch, then one of five-eighths; finally withdraw the trocar and the wire and leave the canula in place; through the canula introduce a drainage tube of a quarter of an inch in diameter; remove the canula, leaving the drainage tube in place. A suitable probe can be introduced through the drainage tube and a counter-opening made at the proper place. After forty-eight hours the opening can be safely dilated to a half inch or more if it is found that the quarter-inch drainage tube is not sufficient.

By this method the tissues are not cut, but simply pushed aside all around, uniformly; there is no cutting at any time, since the edges of the triangular point are blunt; a round or conical point sometimes packs the tissues and does not penetrate; if a vessel or a nerve is encountered it is shoved gently aside out of the way; that is one reason why the dilatation should be gradual and why it is not advisable to pass at once from a one-eighth to a five-eighth trocar. There is no difficulty experienced, as far as the introduction is concerned, in passing from the smallest trocar to the largest.

Glanders is often accompanied by such swelling of the glands and peripheral tissues that life is much endangered thereby.

Inflammation of the tendons and of the muscles of the neck is very rare. The sterno-mastoid and the trapezius are sometimes inflamed more or less, acutely or chronicly; but this will be described with the surgical diseases of the regions to which they belong.

Periostitis and osteitis of the region belong to another chapter. Arteritis presents nothing peculiar. *Phlebitis* of the external juglar is sometimes observed and is recognized by the usual dense cord; it often gives rise to intense pain of a neuralgic character. Phlebitis of the internal jugular is a most grave affection because of the propagation to the lateral sinuses of the brain; it will be described more fully when treating of the diseases of the region of the carotids. *Lymphangitis* is rare on the neck as a primary affection. *Adenitis* is most frequent, on the contrary, following the diseases of the various organs; they will be treated with the regions to which they belong. *Neuritis* is rare. The special organs of the region, the parotid and submaxillary glands, thyroid body and thymus, are liable to become inflamed, but very seldom, and they will be described further on.

Gangrene of the neck, in whole or in segments, is rare; grafting should be resorted to early to prevent the cicatrices and the consequences.

Ulcers of the neck resulting from inflammation are not common unless there has been sloughing. Strumous ulcers are common and often leave an indelible and much-dreaded tell-tale cicatrix. This can be removed when not too large by excision and stitching, leaving only a linear cicatrix instead of the irregular and striated strumous cicatrix. Tuberculous ulcers, secondary to the suppurated tuberculous glands, are also among the most frequent and present the same remarks. Syphilitic ulcers are the next in frequency. Cancerous ulcers are more rare; they are usually due to ulcerated cancerous glands, due themselves to secondary glandular infection; they have already been described. *Fistulæ*, accidental, due to wounds are the most common. Aerial fistulæ are those which communicate with the air passages; they may be laryngeal or tracheal; they are usually the result of wounds, accidental or surgical; they may be congenital, but it is rare; the tracheal are the most frequent, and are oftenest due to incomplete transverse wounds and to the retraction and stricture of the lower end; sometimes they result from the removal of parts of the tracheal cartilaginous rings in thyroidectomy, sometimes to tracheotomy. Alimentary fistulæ communicate with the esophagus or the pharynx, and are called esophageal or pharyngeal; they are usually the result of accidental or surgical wounds or follow the opening of extensive abscesses. Glandular fistulæ are the most common of all, being due to the suppuration of the glands of the neck. Cellulitis or abscess fistulæ following these diseases are comparatively rare. Fistulæ may remain after the complete removal of tumors; after the simple puncture or incision of cysts, of serous bursæ. Dental fistulæ follow the opening of abscesses due to diseased teeth, specially the wisdom teeth; they do not heal until the culprit tooth is extracted. Osseous fistulæ are kept up by some carious or necrosed bone of the region which has to be treated. Fistulæ complicated with erysipelas may be cured by it. Fistulettes may be cured by cauterization. In old fistulæ the orifice is circumscribed by a cicatricial ring inti-

mately adherent to the edges of the loss of substance of the trachea; they demand an autoplastic operation. Plastic operations are necessary to cure many of these fistulæ which remain after the removal of the original cause and after the dilatation and curetting of the tract.

(To be continued.)

THE DIAPHRAGM AND CENTRUM TENDINEUM.

WITH TEN ORIGINAL ILLUSTRATIONS BY THE AUTHOR.

BY BYRON ROBINSON, B.S., M.D.

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The diaphragm is the chief characteristic of mammalian myology. The amphibia and animals below them in scale of structure have no diaphragm. The first distinct trace of it may be found in crocodile and bird, where the muscular fibers which are concerned in its formation arise from ribs. Even animals as high in the ascending scale as birds have an imperfect diaphragm; it does not separate the lungs and abdomen of aves completely. In fact several descriptions have appeared as to what is considered a diaphragm in birds. A complete diaphragm which arises from the vertebral column, ribs and sternum is a mammalian property only. The exact mode of the formation of the muscle is not fully known. The mammalian diaphragm is probably homologous to the so-called diaphragm of other vertebrates. The mammalian diaphragm is supplied by the phrenic nerves, which arise from the fourth, fifth and sixth cervical nerves and course along the lateral borders of the heart in contact with the pericardium to supply chiefly the anterior primitive portion of the diaphragm. In the human species it receives a sympathetic branch from the inferior cervical ganglion. Some of the lower intercostal nerves pass to the midriff. Besides, the diaphragm receives sympathetic branches from the abdominal brain along the phrenic arteries—the phrenic plexus. Originally the body cavity extended in the embryo from the visceral arches to the pelvic cavity; in the mammalian embryo the pericardio-thoracic cavity begins to be distinctly marked off from the future abdominal cavity by a transverse fold. This transverse fold begins at the vertebral and lateral wall, projects median-ward and dorsal-ward into the primitive pleuro-peritoneal cavity. This folds marks the course which the terminal part of the omphalo-mesenteric vein takes in order to reach the heart.

Oscar Hertwig says, "subsequently there is found imbedded in the transverse fold all of the venous trunks which empty into the arterial sinus of the heart, *i.e.*, the omphalo-mesenteric and umbilical vein with the ducts of Cuvier which collect the blood from the walls of the trunk." From this view it would result that the transverse fold—the incipient diaphragm—is intimately connected with the development of the veins. Similar folds are produced in the peritoneum by blood vessels as the plica-duodeno-jejunalis, the folds due to the arteriæ hypogastricæ and umbilical vein. It is known as the septum transversum or as Uskow named it, "massa transversum."

The primary diaphragm really belongs to the heart, as it consisted originally of projecting folds through which were conducted blood vessels to the great fluid or blood center—the heart. It may be noticed that the ventral part, *i.e*, the primitive or original part, of the diaphragm is the older and this explains why the two phrenic nerves chiefly supply the primitive or anterior portion. The muscular portion of the diaphragm gradually projects from the lateral and dorsal aspects toward the central portion of the body cavity between the growing liver and sinus venosus. A final fusion results between the primitive and secondary portion of the diaphragm. The hepatic and diaphragmatic development is inseparably connected early in embryonic life. But first the pericardial cavity is completely closed and then there remains two tubular cavities projecting from the peritoneal cavity bilaterally up to the visceral clefts. His called these cavities, thoracic prolongations of the abdominal cavity—a very suitable name. Into these original peritoneal prolongations juts out the lung structures, growing from the vertebral wall of the intestinal tube. Later in embryonic life the pericardial cavity is closed and occupies the chief ventral side of the embryo, the thoracic cavities now closed occupy the dorsal side, while the rapidly growing peritoneal cavity occupies the posterior portion of the embryo, all three cavities

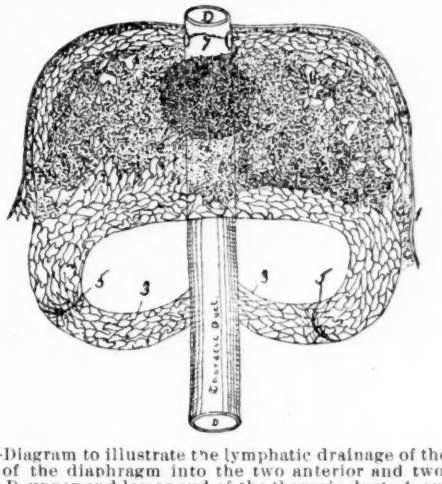

Fig. 1.—Diagram to illustrate the lymphatic drainage of the centrum tendineum of the diaphragm into the two anterior and two posterior trunks. D, D, upper and lower end of the thoracic duct; 1, outer end of the diaphragm; 2, anterior lymph trunks passing on the posterior surface of the xyphoid appendix to accompany the mammary arteries; 3, 3, two posterior trunks of lymphatic vessels which dra n the centrum tendineum and empty into the thoracic duct; 5, 5, valves of the trunks; 6, 7, 8, are dilated lymph spaces in the tendon. The black spot represents the point of the centrum tendineum where the heart rests on it, at which point there are no lymph spaces; 9 represents the mouths of the two anterior channels.

distinctly divided off by the characteristic mammalian muscle of the diaphragm. The pericardial sac first closes from above by the forward projection of the ducts of Cuvier, the primitive diaphragm forming the lower portion of the pericardial sac. Finally the edges of the projecting folds, due to the ducts of Cuvier, fuse and the pericardial sac is formed. The remains of Cuvier's ducts is the superior vena cava. From the dorsal and lateral walls of the trunk project folds, known as the pillars of Uskow, which fuse with the original septum transversum which was thrown into a fold by the veins which course to empty their contents into the heart. The diaphragm has an older ventral part supplied by the phrenic nerves and a younger dorsal part. The pericardial sac is of enormous size in the embryo while the two narrow, lateral tubular sacs hold the rudimentary lungs which are very small from non-use and slight blood supply. But with further ventral growth of the lungs they detach more and more the wall of the pericardium from the diaphragm and from the lateral walls of the thoracic cavity, thus increasing the pleural diaphrag-

matic surface. Again the liver is gradually separated from the primary or ventral portion of the diaphragm by the peritoneum growing over and becoming adherent to the upper surface of the liver, only leaving a small portion of the upper surface uncovered by peritoneum. This uncovered liver surface is bounded by the basal margins of the coronary ligaments. The characteristic mammalian muscle serves mechanically as, 1, a partition to divide the peritoneal cavity from the pleuro-pericardial cavity, 2, to fix the pericardial sac and 3, as a floor to support the pleuro-peritoneal endothelium. Anatomically it is so designed by origin and insertion as to aid respiration, allowing lung expansion and aiding contraction. It permits of much adjustibility of pleura-peritoneal organs. It accommodates itself to the varying size of adjacent viscera. Physiologically the diaphragm is a vast and active absorbent. It is a filter, a sieve for peritoneal fluids (and also to some degree for pleural fluids). A considerable portion of the central part of the diaphragm of most animals is of a tendinous or aponeurotic nature. In some mammals there are several tendinous portions separated by muscular and connective tissue ridges. In cetacea the centrum tendineum is almost obsolete.

Fig. 2.—A diagrammatic profile view of the lymphatic duct with its visceral tributaries and nodules and two posterior lymph trunks from the diaphragm. 1. internal jugular vein; 2, innominate vein; 3, subclavian vein; 3, thoracic duct; 4, 4, small branches of the thoracic duct converging at a point where it empties into the subclavian vein; 5,5,5,5, the two anterior lymph trunks which drain the anterior portion of the diaphragm and accompany the internal mammary vessels, 6,6, the two posterior lymph trunks which drain the posterior portion of the diaphragm emptying into the thoracic duct; 7, 7, a portion of intestine to illustrate the lymph capillary vessels; 9, 9, lymph capillaries; 10, 10, 10, the mesenteric lymph nodes; 11, receptaculum chyli; 12, lumbar lymph nodes or glands; 13, diaphragm. This figure represents the three great divisions of the lymph system: a, the non-valved variable lymph capillaries (9, 9), with sinuous endothelia and excavations emptying into the lymph trunks (10, 10) and nodes; b, the valved lymph trunks with the intervening lymph nodes emptying into the thoracic duct; and c, the thoracic duct (3) emptying into the subclavian vein.

In the study of the histology and physiology of the mammalian diaphragm the chief attention is nearly always confined to the centrum tendineum. My studies were mainly concerned with the diaphragm of man, the dog, rabbit and guinea-pig. The most convenient animals on which to study the central tendon of the diaphragm is the one which possesses a central tendon so thin and transparent that it will require no section for microscopic examination. The cheapest, most accessible or perhaps the most satisfactory animal on which to pursue histologic and physiologic study of the centrum tendineum is the rabbit. The centrum tendineum of this animal consists essentially of four layers, viz.: First, there is a layer of parallel radiating tendinous bundles, passing from the region of the vertebral column toward the costal arches. This tendinous layer lies on the posterior or abdominal side of the diaphragm. In the intertendinous spaces or clefts of this layer, long irregular interstitial or lymph spaces exist; with the naked eye one can observe the radiating tendinous ridges, especially by stretching the tendon. In physiologic experiments it is in the intertendinous spaces that the chief accumulations of colored granules are deposited and really seen by the eye or tracing lens.

The second layer of the centrum tendineum is the circular or that lying on the pleural side of the diaphragm. It is quite uniformly developed, but at localized prints there appears to be an excessive amount collected. These two tendinous layers, the radiating and circular, may be readily dissected from each other.

A third layer of the centrum tendineum is the pleura serosa lying on the circular tendinous layer. It is composed of an endothelia interrupted by stomata vera and spuria. It lies in contact with the lung.

A fourth layer enters into the centrum tendineum, the abdominal serosa. This is an endothelial membrane composed of flattened connective tissue cells, so placed edge to edge, as to produce a membrane which is interrupted only by stomata vera and spuria. The diaphragmatic abdominal endothelia rest on the basement membrane, the membrana limitans, which is perforated by groups of small openings. The histology and physiology of the above four layers of the centrum tendineum will engage our attention both experimentally and microscopically.

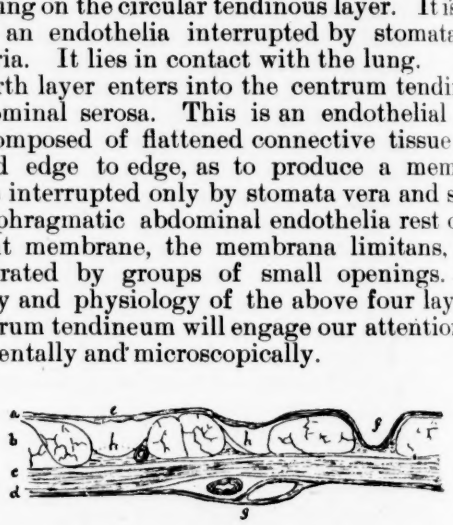

Fig. 3.—(After Ludwig and Schweigger-Seidel, 1866). This is a section of the centrum tendineum of a rabbit, 150 diameters: a, the peritoneum, d, in the pleura; b represents the four radiating tendon bundles; h, h shows the tendinous lymph spaces, one fully and the other partially distended; f illustrates the peritoneum, over a lymph space between the tendon bundles, depressions, i. e., the fluid lymph has disappeared from the channel: g is a blood vessel; c is the circular fibrous layer: e represents the peritoneum put on a stretch over the intertendinous lymph space.

Histologically the centrum tendineum has engaged the attention of original investigators for over thirty-five years. Von Recklinghausen began 1861 by showing that particles suspended in fluid and injected into the peritoneum passed through the serosa of the centrum tendineum and were liberally deposited in the lymphatics of the diaphragm. He used milk, oil, cinnabar, chinese tea, etc. His pupils Pia, Foa and Radjewsky continued his researches. Chzrozozinsky, and his pupil, Afannasiew (1867), did some excellent work on the diaphragmatic peritoneum. The most extensive and far-reaching labors on the centrum tendineum since the epoch-making experiments of Von Recklinghausen were the researches of Ludwig and his pupils, Schweigger-Seidel, Dogiol and Dybkowsky in the Leipsic Physiologic Institute in 1864-67. Those laborers asserted that the peritoneum is a lymph sac. The Russians, Lawdowsky and Kolossow did excellent work. The Italians, Bizozzero, Salvioli, Maffuci and Muscatello were progressive workers, and Bizozzero announced in 1874 that the membrana limitans of the centrum tendineum was perforated by groups of openings. The excellent labors of the Frenchmen are well known, as those of Ranvier, Dubar, Remey, Tourmeaux, Hermann. The Englishmen, Klein and Burden-Sanderson produced meritorious works. The combined labors of these investi-

gators point to the diaphragm or centrum tendineum as the significant locality of physiologic activity of the peritoneum.

The serosa of the peritoneal side of the centrum tendineum presents special features requiring careful attention. If a rabbit's diaphragm be stained *in situ* with .25 per cent solution of $AgNO_3$ and removed without trauma and mounted in glycerin we observe the endothelia and their corresponding dark network of interendothelial spaces; interendothelial substance is discarded. At the common junction of several endothelial cells may be seen structures which are designated stomata vera, while situated along the interendothelial spaces are structures known as stomata spuria. Again, another distinctive characteristic of the centrum tendineum is presented in the microscopic field which consists of parallel dark and light spaces. These dark and light strips radiate from the vertebral region toward the costal arches and correspond to the tendinous bundles and intertendinous spaces. The distinctive feature of the peritoneal serosa of the centrum tendineum is that directly over the radiating tendinous bundles the endothelia are large, regular and possess relatively few stomata vera, while the endothelia covering the light or intertendinous spaces are small, quite regular and possess very numerous stomata vera. Occasionally the large, regular endothelia may not only stretch as usual over the tendon bundles but in irregular distanced localities even bridge all the way across the lymphatic intertendinous channels, taking the place of the small irregular endothelial cells which cover the lymph spaces. In intertendinous spaces the stomata are arranged in rows chiefly occupying the central portion of the space. The light spaces are intertendinous lymph channels, while the dark spaces represent non-transparent tendinous bundles. The intertendinous lymph channels are irregular in shape and size, possess lateral bulgings or sinuses and run parallel with the bundles of tendons. The size of the intertendinous lymph channels vary according to the amount of fluid in them. They measure according to Schweigger-Seidel and Dogiel, from 0.06 mm. to 0.12 mm., *i.e.*, they vary one half in size.

The stomata vera of the peritoneal serosa of the central tendon, located chiefly in the intertendinous lymph spaces, are vertical canals connecting directly, the peritoneal cavity with the sub-peritoneal lymph channels. It must be admitted that there is an uncertainty in the examination of the peritoneum whether the stomata vera really correspond to holes in the serous membrane or not. Yet this uncertainty becomes less as one actually observes that, by injecting fluid holding in suspension solid particles into the abdominal cavity the solid particles will pass in vast numbers into the sub-peritoneal lymphatics of the central tendon of the diaphragm in a few minutes. The stomata vera are lined by granular, polyhedral, nucleated cells. The vertical canal has varying length. Sometimes it may only be as long as the thickness of the peritoneal layer, plus that of the sub-peritoneal lymph vessel wall, or the canal may pass down obliquely. Again, the vertical canal may pass down through a wide lymph capillary field to connect a deep subserous lymph space. In such a case the vertical lymph channel is really invaginated by the lymph space through which it passes.

It is true the stomata vera are irregular in distribution, share, size and number, but that can hardly be considered sufficient proof against their existence. Schweigger-Seidel's theory that the stomata vera are surrounded merely by the nuclei of the adjacent endothelial cells must be abandoned as it does not correspond with the observed facts. One can see the usual nucleus in the endothelial plate, which surrounds the stomata vera in its accustomed locality. In examining specimens of the central tendineum the stomata may be observed open or closed, the mouth may represent a curved line as is easily observed on the lymphatica cisterna magna of the frog. Klein adds another kind of stomata, which are mere breaks or discontinuity in the endothelia leading into some lymph space which is only covered by a single layer of endothelium. Such stomata are not lined by granular, polyhedral, nucleated cells. The application of a solution of $AgNO_3$ to the stomata vera of the diaphragm produces in them a rich brown color, owing to the amount of precipitable albumin they contain. The stomata vera or vertical lymph channels are lined by a special layer of endothelial cells, more or less polyhedral in shape, consisting of granular protoplasm. The expansion and contraction of the granular nucleated cells which line the vertical lymph channels control the lumen of the stomata vera. They have a sort of sphincter so as to control the flow of peritoneal fluids. Ranvier called the stomata vera

Fig. 4.—A figure to represent a portion of the peritoneal serosa of the centrum tendineum of a rabbit after injecting fluid into the peritoneum for forty minutes while alive and again forty minutes while dead. The specimen was slightly silvered, then prepared by a solution of gold chlorid 1 part, acetic acid 5 parts, and water 994 parts, whence it presented a most beautiful and brilliant picture. 2, nuclei; 1, 1 shows the leucocytes emerging from sub-endothelial spaces, through stomata vera or stomata spuria—however, always through interendothelial space; 3 points to a leucocyte emerging from a stoma verum; 5 indicates a leucocyte emerging through a stoma spurium; 6 is a leucocyte entirely free. Note that the leucocytes become elongated as they emerge; 4 and 7 point to the leucocytes shimmering through the cover plate. Under the cover plate the leucocytes are round. Peritoneal irritation induces the leucocytes to come to the surface.

lymph wells and claimed that the so-called granular cells lining them were leucocytes. They are doubtless localities for reproduction of endothelial cells to replace worn-out or dying comrades. My experiments seem to show that the Berlin blue particles may be found passing through deposited in the vertical lymph channels.

On the interendothelial spaces of the centrum tendineum there exists after the application of silver nitrate solution dark spots, rings, ovals, thin rings with large light centers or thick rings with small light centers or very irregular masses. These structures are known as stomata spuria Virchow called them lymphoid cells, Oedmansson, Von Recklinghausen and others called them connective tissue corpuscles projecting upward between the endothelial plates. I am quite well convinced by experiments that leucocytes wander from the lymph spaces below to gain entrance to the peritoneal cavity.

The interendothelial space in the centrum tendineum originally was called interendothelial substance, fluid, semifluid or cement substance. I have discarded all names for the word interendothelial space. By the use of osmic acid as a fixation agent, and silver

nitrate and tannin as reduction agents, we can dissolve the interendothelial space into two parallel lines with an intervening light space crossed transversely by anastomotic protoplasmic processes. The two parallel lines on the borders of the cover plate and the transverse anastomotic processes are the protoplasmic processes which bind the endothelial cells into colonies and groups. The anastomotic processes are thin and fine at the surface but increase in thickness and numbers as they descend from the surface. This interendothelial space gives ample room for contraction and expansion of endothelial cells, contraction of the cells elongate and thin the protoplasmic anastomotic process and the expansion causes the reverse condition. It thus can regulate peritoneal fluids currents.

The endothelium of the centrum tendineum consists of a cover plate (Kolossow, Ranvier), an indurated, hardened, metamorphized portion of protoplasm which is fixed by protoplasmic processes to the subjacent protoplasm, but the lateral edges have little or no connection with adjacent fellow endothelial cover plates. The best animal to study to observe the cover plates are the frog and turtle. The portion of the endothelial cell immediately beneath the cover plate is the real living protoplasmic essential part of the endothelial cell which contains the nucleus. It is contractile and expansive and connected to its fellows in colonies by anasmotic protoplasmic processes. The pleural serosa situated on the anterior or upper surface of the centrum tendineum is similar in structure to the peritoneal serosa situated on the under or posterior surface of the tendon.

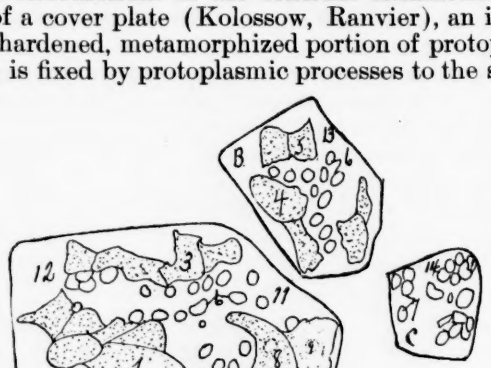

Fig. 5.—Drawn from the abdominal side of the diaphragm of a girl 13 years old to illustrate the pores in the membrana limitans. This diaphragm was removed seventy-two hours after death. It was stained with a 1 per cent. solution of nitrate of silver for ten minutes. It was then placed in carmin colored fluid for ten hours, where it absorbed considerable numbers of colored granules of carmin. It was then placed in Muller's fluid two days, sections prepared by snipping off small bits of the zona tendinea and mounted in glycerin. The endothelia of the diaphragm were in general mostly desquamated and especially the cover plate and its edges were much dissolved. In this diaphragm the apertures of the membrana limitans appear mainly in groups. The groups are in general 10, 20, 30 and 40 in a group. Some groups of apertures in the membrana limitans appear to be 75 or 100, yet this may be where two or more groups coalesce. The size of the holes would appear large enough to admit from one to four red blood corpuscles abreast. Single holes may appear alone in the membrana. There is no doubt that some of the bright spots in the cover plate represent the apertures in the membrana limitans, as it is plain to see in this diagram. Some have interpreted the bright spots in the color plate as holes peculiar to it. The holes are round, oval, oblong, square, but chiefly round or oval. The maceration of the endothelia and their falling off by merely washing or rinsing is one of the best ways to observe the holes or pores. However, on vast areas of the diaphragm one can not see the pores. Hard brushing destroys distinct views of the pores. Nos. 1, 2, 3, 4, 5, endothelia isolated and connected; 6, 6 and 7 show the shape, size and relation of the apertures in the membrana limitans; 8, 9, nuclei of endothelia; 10, 11 and 12 in A and B and 14 in C show the membrana limitans with its pores. It resembles a soap bubble in fineness, but is visibly granular.

We note then that the centrum tendineum has two layers of serosa and two tendinous layers. The elements of the serosa are the endothelial plates, stomata vera et spuria and interendothelial space, which we have discussed sufficiently to expose the views of their structure and significance. We will now discuss the fine membrane on which the endothelia rests, the peculiarity of which is that it is perforated by groups of apertures in the serosa of the abdominal side of the centrum tendineum. It is known as the membrana limitans.

The membrana limitans is a transparent, glassy, fibrillar-like membrane situated beneath the peritoneal endothelia. The earliest amount of this membrane at command is a well-written article by Brinton, in Todd's Encylopedia, 1847, under another name, "basement membrane." Todd and Bowman describe it as "a continuous transparent membrane of excessive tenuity and homogeneous or nearly so." Goodsir (1847) also described it, but he noted that it could be separated into its component cells, which were of a rhomboid and extremely flattened shape. Goodsir named it the "germinal membrane." Many examinations of this subject were made fifty years ago, with the result that vigorous denials of its existence were asserted. Brinton himself could not confirm Todd and Bowman's investigations. Arnold, in his "Handbuch der Anatomie," Freiburg, 1844, p. 216, calls it "a finely granular, fiberless ground substance." There can be no doubt that the basement membrane of Todd and Bowman and the granular fiberless substance of Arnold are one and the same membrane. In 1850 Kolliker, in his "Mikroskopische Anatomie," could not fully confirm the basement membrane, but acknowledged that beneath the endothelial layer there appeared a homogeneous element which was similar to a membrane. Henle, in 1840, "Ueber Serose der Haute," in Froriep's "Notizen," demonstrated this membrane as intercellular substance of connective tissue, and again as formless germinating material. Luschka, in 1851, in "Die Structur der Serösen Häute des Menschen," calls it by various names, as structureless connective material, almost completely homogeneous, of glass-like transparency, smooth or very finely striped lamella. He says it is clear and shining and has the appearance of lightly ground glass. It may be noted that but little could be added to make Luschka's structureless material exactly the same as

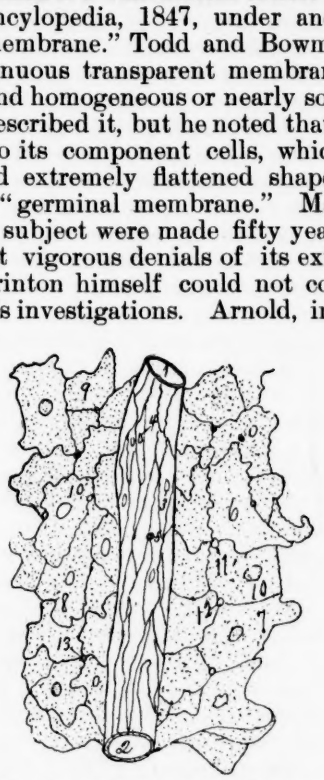

Fig. 6.—Drawn from peritoneal side of a rabbit's centrum tendineum to illustrate a small capillary distinctly invaginated in the vast lymph spaces through which it courses. The diaphragm was silvered and the simple handling of the diaphragm during an experiment suffered to desquamate the free peritoneal endothelium so that one can readily see the blood vessel with its long spindle-shaped endothelia coursing through the vast lymph field recognized on each side by their sinuous endothelia. The lymph spaces pass over the blood vessels, but that is omitted to avoid confusion of endothelia; 1, 2, blood vessel; 3, 4, their nuclei; 5, stoma verum; 6, 7, 8, 9, sinuous endothelia of the lymph spaces; 10, 10, their nuclei; 11, 12, and 13, stomata vera of the lymph spaces.

the differently termed membrana limitans of today. He says this structureless material is found in all the serous membranes between its fibrous elements. The far-famed Reichart, who in 1845 first proposed the term connective substance, considered this material intercellular substance, which is finally transformed into a membrane possessing rudiments of the original cell elements. Luschka incidentally remarks that Todd and Bowman found occasion to call their structureless membrane the basement membrane.

In 1873 Bizzozero, who studied extensively the peritoneum, established the less distinctly seen object of older authors as a definite, recognized membrana limitans. However, it is the same identical membrane of Arnold, Henle, Todd and Bowman, Luschka, Reichart, Goodsir, Kölliker and others. What brought Bizozzero into prominence is not reaffirming the existence of the membrana limitans, but the announcement that the membrana limitans is perforated by apertures on the diaphragmatic serosa. This significant discovery is the only explanation so far offered which explains why the finely divided, colored granules are so rapidly carried into the lymph channels of the diaphragmatic serosa when injected into the peritoneal cavity. The diaphragm is the chief region of absorption of the material injected into the peritoneum, because the membrana limitans is perforated only over the diaphragm.

The membrana limitans has been described in animals by Wadd and others. Bizzozero asserted that it contained no cells, that it is simply finely striped. Acetic acid applied to it makes it swell and become invisible from transparency. I have made long search as to the location of the perforations and so far have never seen the membrana limitans perforated outside of the centrum tendineum. Almost all the perforations of the membrana limitans found have been situated toward the line of junction of the centrum tendineum and the muscular portion of the diaphragm, *i. e.*, toward the costal margin of the central tendon. My best specimens so far came from the human species and the dog. In these the membrane appeared as thin as that of a soap bubble with peculiar fine striations running parallel to each other, resembling glass ground in one direction only. The groups of perforations in the membrana limitans in the human species were apparently larger than in the dog and contained numbers of pores. In one case there appeared to be 80 to 100 pores in one group. In the dog I seldom saw groups containing more than 40 to 50 but oftener much less. The distribution of the groups of apertures were similar in man and dog. The group of pores resembled in distribution somewhat a vast herd of sheep in a wide pasture with larger and smaller groups here and there with but a few stragglers existing between. The distribution of the groups of pores might be compared to the groupings of the gonococcus in a specimen.

Irregularity of number, size and shape of groups characterize the distribution of pores on the peritoneal serosa of the centrum tendineum. The shapes of the pores are chiefly round and oval. The best specimens on which to find the pores are those preserved several days in Muller's fluid or preserved 12 to 24 hours in water, subsequently gently washing off the endothelia. In some specimens the pores could be observed through the serosa of the central tendon. So far in our work we have not found the pores in the center of the centrum tendineum, but always toward the periphery. The outline of the perforation or pore is always sharp and distinct. The circumference of the pore seems to take on the silver stain actively, making it appear quite distinct. Where the pores are located as Muscatello notes, the membrana limitans appears to be quite adherent to the adjacent tissue. As regards the ease with which the pores in membrana limitans may be demonstrated, I must demurr to the idea that it is certain or easy of execution, for one may attempt to find them on many specimens before success results. It is easy to observe that the membrana limitans is thicker and thinner in different localities of the peritoneum.

(To be continued.)

DISEASES OF THE RECTUM AS A CAUSE OF AUTO-INFECTION, WITH REPORT OF CASES.

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Auto-infection is not altogether a new subject, yet it has remained for modern bacteriology and chemistry to demonstrate its relation to, and importance in, the production of disease; and, today no subject commands greater interest or demands more serious thought and careful study, because when more thoroughly understood it will be found to be at the root and foundation of many of the so-called reflex and other obscure diseases. There are many sources of auto-intoxication, but this paper deals more especially with that variety of infection caused by the absorption of toxic substances generated within the alimentary canal by chemic, putrefactive or fermentative changes or bacterial development, aided and influenced by the existence of a pathologic condition of the rectum and contiguous structures.

That I may more clearly elucidate the subject, it will be necessary to call attention to the fact that the physiologic processes of the abdominal and pelvic organs, as well as those of many other organs and parts, depend in a great measure upon a healthy and non-toxic state of the sympathetic system of nerves. These organs, through this same system of nerves, are in profound and intimate relation with the rectum; and, therefore, any diseased condition of it, such as piles, fistula, ulceration, stricture, congestion, inflammation, etc., intoxicates and impairs the function of this system of nerves, and, according to that degree of intoxication and impairment, weakens the defense, modifies the nutrition and perverts the physiologic function of the kidneys, liver, intestines, etc., which in turn favors and invites infection.

It should also be remembered that because of the peculiarity of the nerve supply to the rectum, a patient may, and often does, consider a trivial affliction of this organ as one of great magnitude, while he regards and treats a truly serious and dangerous condition as if of no vital importance whatsoever; or, perhaps, the local manifestations may be so slight that the patient has not the least suspicion of its existence. In fact I have had patients doubt my diagnosis when they were actually suffering from self-poisoning caused by a pathologic rectum, saying it was impossible, as they suffered little or no pain and their bowels were regular. Future treatment, however, convinced them of the correctness of the diagnosis, that the rectal trouble was at the foundation of their affliction. Others again have questioned

my judgment when I have assured them that their rectal affliction was, comparatively, insignificant.

Bouchard tells us that "the organism in its normal, as in its pathologic, state is a receptacle and laboratory of poisons." This declaration is endorsed by our most eminent bacteriologists and chemists. And, further, recent investigations have established the fact that many of the morbid conditions from which the human race suffer have their origin or source of infection in the intestinal canal of their own systems.

The bacillus coli communis, the most prevalent bacterial germ developed in the intestinal tract, has been found in the brain, liver, lungs, kidneys and in fact in nearly every organ of the body. Its toxins are very virulent and under favorable conditions affect the vital tissues most insidiously. The watery extract of putrefying fecal matter within the intestinal canal has also been proven to be, under some circumstances, very poisonous.

Auto-infection is a very insidious disease and manifests itself in a multiplicity of ways. The following are a few of the commoner symptoms observed: headache, drowsiness, lassitude, "tired feeling," loss of ambition, palpitation, impaired appetite, flatulence, indigestion, nervousness, irritability, cold hands and feet, etc. Such patients are usually inclined to be melancholic. The skin has a pale, muddy, greenish-yellow or unhealthy color, and may have the odor of foul-smelling secretions. The breath is also frequently foul. In more severe cases the symptoms are those of impending dissolution. Many of these patients travel from doctor to doctor and are usually treated for grip, malaria, biliousness, nervousness and constipation. They tell you that as long as they continue to take medicine they feel better. This improvement is oftentimes chimeric and simply serves to aid the grim monster of death in more securely and insidiously fastening his venomous fangs into the very heart of their lives. When they stop taking drugs the trouble recurs and frequently in an aggravated form. To cure these individuals it is absolutely necessary to locate and remove the cause of the infection, otherwise it is simply a waste of time, energy, life, happiness and money. Constipation, it may be said, is probably accountable for more ills than any other condition to which human flesh is heir. It is one of the most frequent causes of self-infection, yet it should be regarded as a protection against intoxication, as it presupposes that all that is absorbable has been absorbed. But are constipated people healthy? They have headache, dizziness, lassitude, etc. Hypochondriacs are usually constipated and suffer from all manner of nervous phenomena, such as perverted sensibility, tingling and "creepy" sensations, and mental disturbances. The insane very commonly suffer from constipation. So do many epileptics. I do not say that all these troubles are caused by constipation, but I do say, regardless of the cause, that they are aggravated by it and that it impairs the function of the nervous system. Another point, and one which I wish to emphasize, is that a daily evacuation of the bowels does not necessarily mean that the individual is not constipated, neither does the absence of constipation exclude other ailments.

Were the esthetic young lady aware of the fact that in many instances her bad complexion and other ill feelings were due to the absorption into the blood of fecal matter and its deposit in her tissues and skin, we believe that she would pay more attention to the physiology and hygiene of defecation and the diseases of the rectum and intestinal tract. And further, as we become more familiar with the various poisons generated within us and their great destructive powers, their power to disorder nerve centers and paralyze the action of the vital organs, we come to realize and are forced to admit, that we are constantly standing at the very threshold of self-destruction, that we are our own murderers. In another part of this paper I called attention to the close and intimate relation existing between the rectum, pelvic, abdominal and other organs, and shall now briefly append a few cases to illustrate what serious and dangerous constitutional diseases may be, and often are, caused by rectal affections and that the relief and cure of these afflictions depend upon the administration of proper and intelligent treatment of the rectal ailments.

Case 1.—Mrs. S., consulted in May, 1895, in regard to an external pile. She was emaciated, nervous, had a sallow complexion, palpitation, bronchial cough, pain in the left side and back, also ovarian and uterine symptoms, had no ambition and was inclined to be melancholic; her bowels were constipated and her appetite poor. Suspecting a more serious local trouble than that of an external hemorrhoid, I explored the rectum and found an ulceration the size of a silver quarter, located two inches above the anus. This cured, her symptoms vanished and she regained her usual health.

Case 2.—Miss B., age 25, hysteric, nervous, emaciated, suffering from palpitation and indigestion, bowels slightly constipated, breath foul, bronchial cough and cachetic. Removed four hemorrhoids July last. She now has a beautiful rosy complexion and has gained 20 per cent. in weight.

Case 3.—Bright's disease(?), examination of urine of patient, upon whom I operated for fistula, showed albumin in considerable quantity. He also had slight edema of feet and ankles, waxy complexion and other symptoms indicating Bright's disease, all of which including the albumin disappeared after the operation, when he became healthy and robust.

Case 4.—J. B., age 43, typical case of self-infection. Hypertrophied sphincter, greenish yellow complexion, palpitation, dyspepsia, headache, loss of appetite, nervousness, constipation, etc. Divulsion of the sphincter and a thorough course of the waters at West Baden and French Lick Springs completely restored his health. Will say in passing that I have found the waters of these springs most admirable agents for such cases. By their laxative, diuretic and diaphoretic properties they give the system a most thorough cleansing from all impurities. They are the most potent depuratives of which I have any knowledge.

Case 5.—Asthma(?). Patient afflicted with hemorrhoids and ulceration. Had a chronic cough, cooing râles, tenaceous expectoration and gave a history of asthmatic attacks and evidences of auto infection. The hemorrhoids and ulceration cured; the lungs cleared up, the cough and *asthma* (?) disappeared.

Case 6.—Rheumatism(?). J. S., age 42, presented evidences of chronic muscular rheumatism, for which, to use his expression, he "had taken a barrel of medicine." The rheumatism disappeared simultaneously with the cure of his rectal affliction.

Case 7.—Salpingitis(?). Mrs. R., with soreness in left iliac region, pressure increasing the pain, emaciated, nervous and irritable, irregular as to bowels, leucorrheic and passing large quantities of mucus. Her physician had been treating her for inflammation of left ovary and tube. I diagnosed her condition, catarrhal inflammation of the sigmoid flexure, and by treating her accordingly the *salpingitis* (?), pain, nervousness, discharge of mucus, etc., ceased.

Case 8.—A. R., 53 years old, emaciated, had diarrhea and cough, and was thought to be suffering from consumption of the bowels. By relieving him of an ulceration and stricture of the rectum his diarrhea and *consumption*(?) were cured. It is needless to say that his general health materially improved.

My friend, Dr. Mathews, in his most excellent "Treatise upon the Diseases of the Rectum," reports a number of very interesting and obscure cases, many of which no doubt were suffering also from auto-infection. I herewith submit a brief abstract of one of his cases taken from the chapter on "Reflexes."

Mr. H., a prominent banker, was afflicted with a fissure of the anus. Several eminent physicians thought him afflicted with a malignant disease, which they were unable to locate,

and that he was dying from its effect. Mathews also shared in this belief, saying that from his appearance and condition he thought he had a cancerous disease and that it never occurred to him that the ulceration in the rectum could bring him to such a deplorable condition; and he further says that after the fissure was cured "in a few weeks he resumed his business at his bank, having fully recovered from his *malignant(?)* disease."

Doubtless the reflexes played an important part in this case as well as in some of the others herein reported. Yet it was undoubtedly the auto-infection from which this patient was suffering that caused these able men to err in their diagnosis and opinion.

I could cite other illustrations, but these cases speak for themselves and serve to show that no diseases more secretly impair and undermine the constitution or cause a greater degree of personal distress, or are productive of more misery and suffering or serious consequences than those occurring around the rectum and anus; and yet, notwithstanding their great importance, no class of diseases is more grievously neglected. Granting that the above were cases of auto-infection originating from disease in the rectum (and if they were not what were they?) how many more sufferers might be relieved, or even cured, by properly studying and treating pathologic conditions existing in this region?

To permit this insidious and perpetual fire of infection and disease to gradually, though slowly and surely, burn out man's existence, either by ignoring, overlooking or treating with apathy the real cause of his trouble, and constantly filling him, empirically, with drugs, when by intelligent and proper treatment this destructive flame could be so easily and completely extinguished, thereby lifting him from a pit of misery and wretchedness to that high plane of sunshine and happiness, is but little short of criminal ignorance and negligence.

103 State Street.

HEREDITARY TREMOR.

BY WM. F. WEGGE, M.D.

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Owing to the small number of cases of this disease reported thus far, the following history may be of interest:

C. S., aged 35 years, single, school-teacher, has always been in rather delicate health, but has never been seriously ill. At the age of 22 years, she for the first time observed a tremor of the hands which recurred at intervals, especially when excited or exhausted from work. One year after the first appearance of the symptom, it became worse after an illness of several weeks duration. About eighteen months ago, after an exciting experience in connection with her school-work the tremor became more general, and has continued to grow worse more rapidly, ever since; so that she was finally compelled to discontinue her work on account of the annoyance caused by this distressing symptom.

She states that the tremor becomes more marked in the presence of strangers, and for this reason she has avoided coming in contact with them for some time past. When alone it is very much less intense and disappears when she is at rest.

On examination the tremor is found to affect the upper extremities and the head more particularly. It is slow, rhythmic and affects speech somewhat, which is slow and strained, apparently in the effort of suppressing the tremor. Nystagmus is absent. The hand writing is clear, firm and gives no evidence of tremor. An examination of the nervous system is productive of only negative results. The patient is somewhat depressed on account of her condition and presents some neurasthenic symptoms. Aside from this the psychic functions are normal.

On further inquiry the following family history is obtained. The parents are both living. There is no history of any irregularity of habits, etc., on either side. The father has always been nervous and has been afflicted with a tremor of the hands ever since some time previous to his marriage. His mother had a tremor of the head at the age of 35. The patient's mother's half-sister became insane at the age of 18 years, and died insane at the age of 60 years. The mother's father was periodically insane. One of the patient's sisters died during her confinement at the age of 35; was previously healthy as far as can be ascertained. Another sister, aged 25 years has had a tremor of the head for several years past. The third sister, aged 15 years, is afflicted with a tremor of the head and of the hands since childhood.

Hereditary tremor appears to be a rare disease. Brasch after a careful review of the literature on the subject has found reports of only thirty cases. He suggests the designation "Essential Hereditary Tremor" as the most appropriate one, since it is descriptive of the disease. The essential feature of the disease is the hereditary occurrence of tremor, without any other symptoms of nervous disease.

Clinically, hereditary tremor possesses no characteristics, being subject to many individual variations. In some cases the tremor is slow, rhythmic and with slight excursions. In others it is rapid and less regular. It may be confined to the upper extremities, which appear to be most frequently affected; or it may involve these together with the head, eyes, tongue and vocal cords. The lower extremities appear to be less frequently involved. In the majority of cases it is absent when the patient is at rest, but in some cases it continues even during sleep. Excitement and excesses of every kind tend to increase it. It may develop gradually and increase progressively, or it may develop suddenly and remain stationary thereafter. The age at which the disease begins varies much. In my case it began at the age of 22; in the case of one of her sisters at about the same age and in the younger sister during childhood. The age at which the disease first put in its appearance in the case of her father and in that of her paternal grandmother is indefinite, but it began rather early in life. Hereditary transmission is not always direct from parent to children, since one generation may be exempt, and the following generation inherit the disease.

More recently some authorities (Raymond and Serieux, Hamaide, Vantrin, Achard) have expressed the belief that a relationship exists between heriditary tremor and psychic degeneration.

That this relationship is a fact in all cases is certainly doubtful but in many cases one is almost forced to the conclusion that some such relationship does exist. My case is of little value in this connection. The patient's father has always been "nervous." It is evident that this may be interpreted in various ways. It certainly is very probable that the existence of a tremor would impress those about him as an evidence of nervousness. On the other hand the patient's ma-

ternal grandfather and aunt were insane. On first thought this fact may look like evidence supporting the above stated belief. A more careful analysis however will lead us to the conclusion that it is not. As far as I have been able to ascertain mental or nervous diseases have not occurred on the father's side. Neither have there been any peculiarities of character or disposition. The only evidence to be found is the tremor occurring in the father and in his mother. The maternal branch of the family can not be held responsible for the tremor occurring in these two cases. Then why should it be in the case of our patient? In two cases out of the three reported by Brasch no evidence of psychic degeneration could be obtained.

In the absence of reports of autopsies in such cases we are not informed of the pathologic changes, if any exist, upon which this peculiar disease is based.

The prognosis has been unfavorable with few exceptions. Haebler has reported a case in which recovery occurred after several applications of the faradic current for the relief of an intercurrent radial paralysis. It is doubtful if other cases that have been reported recovered were true cases of hereditary tremor. In my case the neurasthenic symptoms have disappeared under treatment but the tremor continues, though less severe.

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NITRATE OF SILVER IN DISEASES OF THE SKIN.

Read before the Society for Medical Progress of the West Side German Dispensary, New York City, Jan. 9, 1897.

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At a time when the markets are flooded with new remedies, each one backed by innumerable clinical observations, it would indeed seem reckless presumption to speak about one laden with age. But, while in the wide range of applicability the drug for which I propose to take up the cudgels this evening falls far below many of the recent ones, yet in effectiveness, circumstances and conditions remaining the same, it outdoes all the latest rivals and arrivals.

My object here is to speak about nitrate of silver, its value in the local treatment of diseases of the skin.

The physiologic action of nitrate of silver as applied locally, depends upon the strength of the salt employed. It may be caustic, escharotic, astringent and alterative, each condition resulting from the use of the mitigated, pure, saturated or very weak solution. A quality of silver nitrate passed unmentioned by writers on materia medica, but one which is probably recognized by all physicians, is this, that the salt of silver, even in its weakest state of solution, is a good antiseptic. There is little doubt but that its excellent effects in gonorrhea, ophthalmia neonatorum, etc., are due to its antimicrobic properties.

Wart.—Every variety of wart is amenable to nitrate of silver. Silver caustic has been used successfully in the removal and destruction of these papillary excrescences from time immemorial. The location of the verruca is no contraindication to the use of silver, but the size often is; for example in a case of condylomata acuminata, or venereal warts, in which the luxurious growth of the papillary buds covers a large surface, the use of silver, by reason of pain and hemorrhage, would be impracticable as well as objectionable. The technique in all cases is simple: Work the silver stick down to the bottom of the wart, make a few sweeps around, and the papillomata, by virtue of the chemic and mechanical action of the hard[1] lunar caustic, will be destroyed. Or, scrape off the lesion with spoon or finger nail and then apply the silver stick—here the salt acts as a caustic in destroying that which the spoon or nail failed to get away, and as a styptic in stopping the bleeding.

Corn.—I venture to recommend nitrate of silver in that form of epidermal callosity commonly called corn. Soak the corn in hot soapy water, then shave down the horny layers and then apply a 30 per cent. solution of silver nitrate. If personal experience is the best form of clinical evidence, then I could conscientiously testify to the effectiveness of this mode of treatment. The corn will never, or hardly ever, suffer resurrection after the silver has been applied to it.

Lupus Vulgaris.—Certain forms of lupus vulgaris are eminently adapted to the local application of nitrate of silver. The first indication is found in the small lupus papules which characterize the commencement of the destructive disease. It is evident that by effectively cauterizing the primary lesions the disease will be prevented from taking root. The second indication is suggested by the lupus nodules which are formed by the coalescence of the initial papules. Lupus in both these forms can be radically cured by and through the thorough application of silver caustic. The third indication is the serpiginous form of lupus. Here silver is used as a means only to stop the downward march of destruction. Kaposi[2] thus speaks of silver in the treatment of lupus vulgaris: "Apart from mechanical treatment, the use of caustic is important. The most practicable is solid nitrate of silver. It has sufficient resistance to penetrate the individual lupus nodules, thus uniting mechanical and caustic action. It also possesses the advantage that it does not enter healthy tissues. Large nodules of lupus tumidus, and particularly superficial infiltrations, may be burned out as thoroughly as with the sharp spoon. Since the solid stick not only destroys the vessels of the border and base mechanically, but also causes thrombosis, the cauterization furnishes all the requirements for effecting a cure." In the face of this eminently authoritative statement, it is hard to see why some writers of distinction fail to include this agent in the local therapeutics of lupus.

Epithelioma.—Lunar caustic finds a fitting place in suitable cases of epithelioma of the skin and mucous membranes. Generally speaking, the method of applying the caustic in cutaneous cancers is the same as in lupus or in the other growths above mentioned, but the indications are fewer. As in lupus, when the cancerous nodule or ulcer is small, nitrate of silver is an effective and curative remedy. It is also indicated in inoperable cases, in recurrent nodules and serpiginous forms of epithelioma.

The employment of the silver stick in various non-specific ulcers on the legs or other parts of the body, applied with the object to remove spurious granulation tissue, or to freshen up indurated edges, this use of silver is so universal that it needs mention only.

[1] The author, in every instance mentioned in this paper, refers to that form of lunar caustic the composition of which is: One part silver and three parts nitrate of potash.

[2] Kaposi: Pathology and Treatment of Diseases of the Skin. American translation, page 555. 1895. Wood & Co.

Of venereal ulcers, those most amenable to the treatment with silver are chancroids and the phagedenic type of either hard or soft ulcers. Specific ulcers pursuing, so to speak, a regular course of evolution and involution, should not be subjected to any cauterizing process whatever—silver or galvano-cautery; its treatment, however, is not the object of this paper. Chancroids, when properly treated from their very inception, rarely require the caustic action of silver or any other metal, salt or acid; it is only those soft ulcers whose treatment was unmethodical by the physician, or neglected by the patient, or abused by the quack, which become subjects of the silver treatment. In all those neglected ulcers the application of saturated solution of silver once or twice will materially change their looks and aspects, so that instead of the dirty-looking slough at the base and edges, healthy granulations will take its place in and around. There is one contraindication to the use of silver in chancroidal ulcer, and that is the locality or site of it. An ulcer situated at or in the meatus, or urethra, should not be cauterized, "since such cauterization is liable to produce edema and even result in stricture."[3] In case of phagedenic ulcers, I believe that Ricord's nickname for potassio-tartrate of iron, is admirably adapted to silver nitrate, namely: It is the born enemy of phagedena." It is as good as the actual cautery. The result I have had and the results I have seen from the repeated applications of a saturated solution of silver nitrate to this class of intractable ulcers were indeed most gratifying. Ulcers which threatened to destroy the penis and some adjacent territory, were first checked and afterward cured by the timely and judicious use of this drug. This treatment should especially recommend itself to the man in general practice whose armamentarium may be lacking in a Paquelin cautery, or even to specialists who are well armed with instruments but whose patients stubbornly resist the application of "hell on earth," as one of my blasphemous victims specified the hot iron. It is true that annoying edema occasionally follows the application of the salt, but this drawback can be equally charged to the cautery. The application to the ulcer of a piece of absorbent cotton saturated with a 4 per cent. solution of cocain should always precede the silver treatment. This precaution will insure rest and quiet to the patient during the treatment, which should not last longer than a minute. Base and edges should be made the harbor of the solution. The mode of applying the silver is simple: Wind wadding around a stick or the uncharged end of a match, dip it in the solution and apply it. The frequency of the application is regulated by the resistance of the lesion to the treatment. Sometimes one application is enough and at other times two or more are necessary. The treatment after healthy granulations are set up, consists in the use of dermatol, boric acid or any other mild antiseptic.

Erysipelas.—As long ago as 1829 an English observer, Mr. Higginbottom,[4] advocated the use of nitrate of silver in the treatment of erysipelas. He believed that with nitrate of silver, if properly applied, the spreading of the disease could be prevented. In 1869 the same observer reiterated his recommendation with renewed emphasis and additional conviction. He attributed the neglect of adopting this method of treatment to an imperfect understanding of its correct application. The following are his directions: "The affected part should be well washed with soap and water, then with water alone to remove every particle of soap, then to be wiped dry with a soft towel. The concentrated solution of 4 scruples of nitrate of silver to 4 drams of distilled water is then to be applied with a small piece of clean linen attached to the end of a short stick, the linen to be removed at every subsequent application. As the solution of nitrate of silver is colorless, it is necessary to pass a little linen, just moistened, over every part where it has been used, in order to be equally diffused, so that no part may be left untouched. In about twelve hours it will be seen whether the solution has been well applied. If any inflamed part be unaffected, the solution must be immediately reapplied. Sometimes, even after the most decided application of the nitrate of silver, the inflammation may spread, but it is then generally less severe, and is eventually checked by repeated application." According to Wood, "this plan of treatment received a great deal of commendation from authorities." Wood also reports ulceration in two cases "apparently the result of the treatment." Personally, I have had no experience with this method of treating erysipelas; my lack of experience is not due, however, to hesitancy of adopting it, but rather to ignorance of the recommendation. It is reasonable enough to merit trial.

Eczema.—Most important of all diseases of the skin in which nitrate of silver does the most good is that form which is designated by the name of eczema intertrigo. This condition is always the result of friction and sweating occurring between two opposing surfaces of the skin. Therefore it is most commonly found in the axilla, bend of the arm, popliteal space, behind the ear, under large pendulous breasts especially in stout women, between fingers and toes, and last but not least, on and around the genital organs of male and female. This form of eczema is characterized by a destruction of the epidermis, weeping surface and intense itching. The first effect of the application of the nitrate of silver in any of these cases is a cessation of the terrible and agonizing itching; second, a discontinuance of the weeping; third, a stimulation of a growth of new epidermic cells and consequent restoration of normal tissue; in other words, the patient is cured. My experience in the treatment of eczema intertrigo in male or female genital organs is very considerable, and the almost uniformly excellent result obtained from the application of nitrate of silver renders me quite enthusiastic in my recommendation. It is no exaggeration to say that silver succeeded where other drugs eminently failed. It would certainly be a burden for you to listen, although a pleasure for me to recite, a long list of clinical histories of the patients thus treated. I must content myself with stating the fact that among the patients who were treated with nitrate of silver for eczema intertrigo could be found young and old—men, women, children and infants. The condition in some existed, prior to treatment, for weeks, in others months, and still in others, years.

Strength of the solution: The site of the eczema determines the strength of the solution to be used. The fluid is applied in the same manner as above described in the case of ulcer. It must be mentioned in passing that the silver stick is never applied in

[3] Robert W. Taylor: A Clinical Atlas of Skin and Venereal Diseases, p. 103, 1889. Lea Bros.

[4] Essay on the use of nitrate of silver, Ed. 2, London, 1829. Higginbottom's Practice, 1869, ii, 34. Cooper's Surgical Dictionary, Vol. ii, p. 573, 1872. Therapeutics, its Principles and Practice, H. C. Wood, 1891, p. 480.

these cases. Now then, a 3 per cent. solution of silver is applicable to eczema intertrigo when located at the following places, namely: Behind the ears, on the penis, and between fingers and toes. Ten to 20 per cent. in the axilla, bend of the arm, under pendulous breasts and labia majora, in the latter event especially when the trouble is due to diabetes (pruritus). Twenty-five to 50 per cent. on the inner surface of the thighs and pubis. On several occasions a .5 to 1 per cent. solution was applied with benefit, in the form of a wet dressing, to a scrotum which was the seat of chronic eczema for months, if not years. The appearance of such a scrotum is quite characteristic; its tissue and size are increased in thickness and extent, and the indurated, rough skin is thrown into itching folds. The application in all these cases can be repeated three or four times during the week; the only time to stop is when an unduly marked hyperemia occurs, as it sometimes does, after the excessive use of the medicinal agent.

In acute and chronic eczema of the face and head, of infants and children, a 3 per cent. solution of silver nitrate is at times very serviceable. But the application need not and ought not to be kept up too long, as the above mentioned resulting hyperemia in some cases will interfere with its speedy and good effects. "Occupation eczema" sometimes can only be cured by the application of a 3 to 5 per cent. solution of silver nitrate. In all these instances the treatment in the interval consists of powdering the parts with bland powders and in keeping them well separated with wadding to prevent further friction.

Parasitic eczema.—Eczema marginatum is a disease which very frequently defies all sorts of applications, but will yield to a strong solution of nitrate of silver. I never began the treatment of marginal eczema with a solutiou of a strength less than 20 per cent., and very frequently applied a 50 per cent. solution. The raving itching can be successfully combated by this drug, while a complete cure is not a remote possibility.

Herpes tonsurans is the only other parasitic skin disease which can be practicably treated with silver. The application of silver to ring worm is, however, limited. The discoloration the salt produces would be a strong objection to its extensive use on the face, for example. Yet in suitable cases nitrate of silver is a clean and effective remedy. Not very long ago a friend, a young counsellor, visited one of the Turkish baths of the city. A week after, at least this was his affidavit, the right side of his gluteal region became the seat of a good baker's dozen of ring worms. After a few applications of nitrate of silver (30 per cent.) he was completely cured. The discoloration in this case was no ground for objection.

I now come to consider the last condition in which nitrate of silver is in the highest degree *the* drug. I refer to pruritus ani. The difficulty in managing this symptom can only be appreciated by the multiplicity of suggested therapeutics. It is evident that the proper treatment of a symptom is the removal of the disease. Such, however, is not always the case with itching of the anus. It frequently happens that after curing the hemorrhoids, the fistula, the constipation, the pin worms, etc., the itching will still continue unabated. Sometimes it seems as if it becomes a habit with the anus to itch and the patient to scratch. Besides, there is no denying the fact that the pruritus is often present to an excruciating degree while all efforts to find its cause end in failure—we then take refuge in that mysterious term, neurosis. While eczema may occur, either localized at the anal region or as an extension and continuation of such a condition existing at the genital organs, yet in a great majority of cases the eczema in the case of pruritus ani is secondary, the result purely of that constant scratching in which all patients take a fiendish delight. In the treatment of this distressing ailment there is nothing in the pharmacopeia better, more effective, more gratifying to the patient and his medical attendant, than the vigorous application of a strong solution of nitrate of silver. In all cases the cause should be sought and when found removed, but if the pruritus still continues, apply a 30 or 40 or 50 per cent. solution, depending on the severity and intensity of the itching, and your reward will be worth the effort. In instances where the pruritus is apparently idiopathic, nitrate of silver in the strength alluded to is a veritable specific. Even where there is a palpable cause, silver will insure rest at night and quiet by day while the cause is being removed. The application should be made once or twice a week; in the interval, if necessary, use zinc salve plain, or with cocain (1 per cent.) in it. The preliminary use of cocain (4 per cent.) before painting the anal region with the solution of silver should never be forgotten, for while it does not obviate the subsequent transitory burning produced by the silver, it still mitigates it while the solution is being applied.

I am at an end of the discussion. I am aware that something is still missing in my paper, and that is an explanation of the *modus operandi* of the nitrate of silver in each and all of the diseases mentioned. But as the *rationale* is not far to seek, and as the physiologic action of the salt is so well understood, it is hardly worth while entering into it in a purely clinical paper such as this.

As a final remark I must state that many of the observations herein recorded were made and treated in private and dispensary practice, and that my entire experience with this valuable drug was rendered possible by my long, useful and grateful assistantship to that distinguished dermatologist, Dr. S. Lustgarten, in his skin clinic of the Mt. Sinai Hospital Dispensary.

156 Clinton Street.

THE PATHOGENESIS OF GOUT.

BY HANS FROELICH, A.M., M.D.
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Garrod demonstrated in 1848 with his thread test the presence of uric acid in the blood in gout, and basing himself upon this fact, said that in gout there was reduced capacity of the kidneys to pass uric acid; and second, that the alkalescence of the humors in gout was decreased. Charcot believed in an increased production of uric acid, caused by a functional disturbance of the liver, and Cantani thinks that the uric acid originates in the cartilages themselves, and believes that the uric acid diathesis is the consequence of disturbance in the nutrition of the cartilages, the ligaments and the tendons near the bone. The scientific researches in gout and kindred diseases had for forty years been under the ban of Garrod's discovery; all the immense work done within this span of time has been in vain, of no practical value, because now we know that not only the methods which had been

employed for the discovery of uric acid were so inexact as to render the results almost valueless, but it has been proven that uric acid and the substance which generates it, is found in many other diseases without causing gouty symptoms. Von Jacksch found that in the blood of the normal muscle there is no uric acid, but that it is present in pathologic conditions, as in dyspnetic diseases like pneumonia, nephritis, and constantly in anemia. More and more evidence of this fact has accumulated. It was proven that diet had less influence upon the generation of uric acid than was supposed; it has been demonstrated that uric acid is constantly and considerably increased in leukemia, where it reaches the amount of 4 to 5 grams within twenty-four hours; even where the uric acid has been found not to be increased as such, it is always increased in its proportion to urea. Yet this increase of uric acid in leukemia never produces gout; there is in fact only one case known (Priebram's case) where gout complicated leukemia.

The first great step in discovery of the pathologic facts in this disease was taken by Ebstein, who proved (1882) that the precipitation of urates always is preceded by a necrosis of tissue, a purely local process, thus indorsing Cantani's views. Ebstein found characteristic changes in the kidneys, a shrinking caused by interstitial inflammation and accompanying deposits of urates, mostly biurate of sodium. Litten found that urates sometimes not only fill up the tubuli, but are interspersed within the interstitial tissue, and Dickinson joins him by declaring that precipitation of urates takes place solely within the intertubular fibrous tissue and that this part of the organ, thickened by a kind of inflammation, shrinks, compresses the tubuli, causing thereby the granulated kidneys. Wagner demonstrated that lead poisoning can be at the basis of this inflammation, and give rise to consecutive gout or deposition of urates. Cornil and Ranvier are convinced that in the gouty process of the cartilage the cells take part in the inflammation, and Rindfleisch calls them the very centers of the starlike crystals of urates. Ebstein found that the inflammation and precipitation of urates follow the cartilage fibrils, that is, their connective substance. The necrosis of tissue, according to his view, is secondary to the disturbance of the nutrition, which is the primary phenomenon of gout and must have reached the most advanced degree, must present the symptoms of complete decay before urates precipitate. Concerning the cause of this necrosis Ebstein clings to the view of all others, that it must have been caused by the gouty matter, the fluid uric acid, but he is not able to explain why the uric acid should cause tissue necrosis here and not in leukemia or other diseases which are accompanied by presence of uric acid. The question as it stands today is that we have a tissue necrosis in certain points of predilection, preceding precipitation of urates into these necrotic localities.

The questions we have to solve are:

1. What causes the pathologic appearance of uric acid in the tissue and blood?

2. What causes this necrosis?

3. What is the physiologic treatment of gout, after we have answered these questions?

The first question has been fully answered by Horbaczewsky (1892). His discovery brought us near the solution. He found that in maceration of nuclein-containing tissue outside of the body, which is produced by a certain degree of putrefaction or through boiling water, there are products split off, which produce uric acid. It is furthermore a fact, that nuclein-containing substances decay within the living body too; one is entitled, therefore, to suppose that the uric acid within the living organism originates from leucocytes.

The fact that in leukemia, where leucocytes decay *en masse*, the production of uric acid is constantly and considerably increased, confirms this supposition.

The further fact, that quinin and atropin, which arrest the formation and decay of leucocytes, reduce the production of uric acid, is another proof.

W. Weintrand (1895) in his investigations upon the influence of the nuclein contained in food upon the formation of uric acid, comes to the following conclusions:

The recent investigations with reliable methods concerning the secretion of uric acid, demonstrate that it is dependent in a high degree upon the metabolism of albumin. It has been found that animal or vegetable food had not the energetic influence which formerly it was supposed to have, even the quantity of the secreted uric acid did not vary according to the increased or decreased quantity of fed albumin.

It became evident that the absolute quantity of the secreted uric acid is individually somewhat varying, but represents a pretty constant quantity eagerly retained by each individual.

This agrees with Horbaczewsky's hypothesis, that uric acid originates from the metabolism, that is, from the decay of leucocytes, and that there is a constant proportion between the secretion of uric acid and the number of leucocytes. The increasing recognition of Horbaczewsky's theory removed the influence of food upon production of uric acid still more to the background. It was thought necessary to adopt this view only so far as the introduction of food produces digestive leucocytosis.

Weintrand demonstrated to a certainty that nuclein-containing food, thymus, brain, etc., is perfectly absorbed and causes a considerable increase of uric acid and its excretion.

The resorbed nuclein influences merely the formation and decay of leucocytes and by their increase indirectly the production of uric acid.

Horbaczewsky says that the number of leucocytes in fasting condition is small (hypoleucocytosis) and increases at once after introduction of food (leucocytosis). A similar parallelism exists if we compare the number of leucocytes of persons of various age, sex, nutrition, etc., with the secretion of uric acid of such persons. Children have more leucocytes than adults and secrete more uric acid. Women have less leucocytes in the blood than men and secrete less uric acid; also well nourished people have more leucocytes in the blood and secrete more uric acid than others do.

Not each rise of temperature causes increased secretion of uric acid, only the character of the fever is of influence (Bartel) as we see in the epicritic increase of uric acid after acute feverish diseases. This inflammatory leucocytosis takes place in croupous pneumonia, when the secretion of uric acid shows a hypernormal value during the fever, still increasing with falling temperature, and reaches its height when temperature is normal, and it increases in the same measure as the number of leucocytes decreases. T. F. Richter also says it is certainly true that this con-

nection between uric acid and leucocytes exists, but we do not yet know the degree of it; we know how much uric acid is secreted, but not how much has been formed in the organism.

According to F. Levison (*Zeitschrift für klin. Med.* 1894, p. 292) uric acid can not, like urea, be considered a metabolic product of albumin introduced through food. The secretion of uric acid in the body can not be considerably increased through introduction of large quantities of easily digested albuminates, neither decreased by hunger diet. It is generated through oxidation of the organized albumin in the body especially the nuclein, and its secretion is increased or decreased by all factors which produce a faster or slower destruction of the cellular elements of the body, especially the leucocytes, like disease, medicines, poisons, etc.

The production of uric acid in the body is in direct proportion to the number of leucocytes used up within that given time. So it is with the well known increase of uric acid of infants, it is directly proportional to the increase of leucocytes. Fleasburg found six hours after birth infarcts of uric acid in 14.3 per cent. of infants; twelve hours after birth in 56.2 per cent.; after twenty hours 94.7 per cent. These oscillations in uric acid are in direct proportion to the amount of leucocytes, which rises the first days after birth and then decreases until the fifth day, when it reaches the point where it has been the last month of fetal life.

Number of leucocytes in the last month of fetus 8,053; immediately after birth 19,600; twenty-four hours after birth 23,000; forty-eight hours after birth 17,500; fifth day after birth 8,500.

Gundoline examined the number of young, ripe (neutrophile) and over-ripe leucocytes and found:

	Leucocytes per sq. cm.	Young.	Ripe.	Over-ripe.
Last month of fetal life	8,053	1,013	556	6,458
Right after birth	19,600	4,000	2,352	12,348
Twenty-four hours after birth	23,000	5,520	1,840	15,640
Forty-eight hours after birth	17,500	3,695	1,575	12,250
Fifth day after birth	8,500	2,720	680	5,100
Nursing-age	12,908	7,598	833	4,477

This table shows the rapid transition of leucocytes into the over-ripe form. They can increase in pneumonia to 40-50,000 (Monti, Bergrun), though never in typhus.

Levison doubts the existence of leucocytosis in gout and ascribes the production of uric acid to retention by the kidneys (Garrod, Roberts).

The renewed activity in this whole question brought out a few publications about the metabolic changes in leucemia, which has so much in common with gout and which I report here only with the purpose to more fully exhaust the metabolic parentage of uric acid.

Kuehnau relates statistics of two cases. The leucocytosis in these cases was about constant at the beginning; the daily secretion of uric acid vacillated between 1.5 and 2 grams. This was succeeded by a period of increase of leucocytes which was followed by an increase of the daily secretion of uric acid. After this a rapid decrease of leucocytes set in, while uric acid even increased to 3.39 grams. This certainly gives basis to the apprehension that uric acid is formed through destruction of leucocytes.

The most exhaustive publication about leucemia appeared lately in the *Berl. klin. Woch.* by A. Fränkel. He found the marrow of the bone always diseased, the spleen only sometimes enlarged. Fränkel's investigations of the blood of acute leucemia are the only ones thus far published. He found increase of the white and decrease of the red corpuscles, the leucemic character of the blood is based exclusively upon an increase of mono-nuclear cells of the character of lymphocytes, which had lost the ameboid motion, the multi-nucleated cells were present only in minimal quantity. The cartilages in some cases swell and are painful, the pain extends over the bone. Two cases which died from septic infection, showed with the appearance of the infection an immense decrease of leucocytes, which Fränkel attributes to leucolysis; with this leucolysis the general condition of the patient grew worse, which was partly due to this leucolysis, partly to sepsis. With the decrease of leucocytes the uric acid increased considerably, not only relatively to the present urea, but absolutely. The secretion of uric acid in leucemia can increase to five or six times the amount of the normal secretion. This publication again demonstrates conclusively that destruction of leucocytes is essential as regards the amount of uric acid secreted.

There are only a few micro-chemic investigations published, but those confirm the facts gained by experiment and investigation on pathologic specimens in regard to the origin of uric acid from leucocytes.

Neusser (*Wiener klin. Woch.*, 1894) found the number of leucocytes always decidedly increased, contradicting Levison, who denies any leucocytosis in uric diathesis. He observed the appearance of particular granules and formations of lumps within the protoplasmatic zone, mostly in the immediate surroundings of the leucocyte nucleus which color black with the basic component of Ehrlich's triacid. They form perinuclear granulations roughly dentated, especially within the mononuclear large and small leucocytes, sometimes in polynuclear neutrophile and even in eosinophile cells, probably a forerunner of uric acid.

Neusser found these changes in gout, muscular rheumatism, asthma nervosum, chronic dermatitis, diabetes, neuralgias, migraine, vertigo and neurasthenia.

L. Heine (*Zeitsch. für phys. Chemie*, xxi, i) says nucleinic acid, unpaired, possesses very peculiar qualities, which disappear more or less in the paired combinations with albumin, and one is justified in thinking that formation and destruction of these combinations is a physiologically important process, which is connected with important functions of the nucleus. Liberfeld's experiments with Ehrlich's coloring demonstrates that in those conditions where a morphologic partition goes on, also a chemic dissolution of the nucleus constituents takes place, a splitting off of neuclein acid from albumin. Heine believes himself to have found that the essence of mitosis does not consist in a chemic dissociation of the nuclein bodies; these substances seem more to preserve their peculiarity as albumin combinations of the nuclein acid, only their physical grouping is modified in mitosis for the purpose of exact bisection.

In the above we have been able to demonstrate that the uric acid in the human body is generated by the decay of leucycotes, which have not reached their full physiologic development, that it is not a weaker oxidation of the albumin of the food, which latter always is oxidized, to urea. This destruction of leucocytes, for which Loevitt gave the name of leucolysis, is always preceded by a leucocytosis. Leu-

colysis is a chemic process which separates nucleinic acid from the albumin.

We proceed now to answer the second question.

What causes the necrosis in gout? The solution of the question as to the generation of uric acid has great practical importance, inasmuch as it tells us that without leucocytosis there is no leucolysis, without leucolysis there is no formation of uric acid, and that only food rich in nuclein increases uric acid. We know furthermore that in many other diseases formation of uric acid takes place within the blood without accompanying necrosis and gouty symptoms, and still the belief in uric acid as *causa peccans* is paramount; no discoveries, no reasoning is potent enough to unsaddle the uric-acid diathesis in the mind. Philosophy used to, and still, plays too big a rôle in our science, as long as it could not lay claim to be an exact science; but the practical results of our physiologic researches upon the recognition of morbid conditions and their treatment, have changed this also. There was so much we did not know that we had to make up for this apparent deficiency with some theory, which used to be labeled with a big name, sufficient to embrace a controlling part of the things which we do not know or know but little. This comprehension of a whole mass of vague ideas and fallacious conceptions, I might say a world of negatives within a seemingly positive name, for the time covered up this chasm in our knowledge, the habit to classify nothingness within something became second nature and we thought we were talking science when we generalized a whole lot of negatives in groups as hysteria, functional nervous diseases, etc. When I, a few years ago (*Med. Mirror*, January, 1893), demonstrated that these functional nervous diseases were built up on the same physiologic and pathologic basis as chronic rheumatism, a few called it ingenious, the great army of authorities and their blind followers shrugged at last their shoulders and ignored it. Yet I had the satisfaction to see that chorea was taken away from the functional nerve diseases and referred to the rheumatic diseases, and only lately Leyden declared that tabes was of peripheral origin, caused probably by the same influences which generate usually rheumatic disorders. The same conditions hold good with that devotion to the uric diathesis, it serves as a covering of the most incongruous morbid states and affilliated diseases which have a pathologic or physiologic relation whatever. Rheumatism and gout are—especially by the English school—thrown together in all possible modification of Greco-Latin nomenclature, rheumatic arthritis, rheumatoid arthritis, gouty rheumatism, goutic rheumatoid, meaning to say something which does not really exist. How grateful am I to Roentgen and his rays, which will establish in most of the cases the absolute absence of any urates! Rheumatism can be following gout as it follows any disintegration of tissue or necrosis through the disturbance of the lymph current (lymphostasis), but that is their whole affinity, with the sole exception of one etiologic fact, the want of exercise and indulgence, too much and too often, in all good palatable things. There the relationship stops. Rheumatism is essentially of delicate reaction upon atmospheric changes, vacilliations in the humidity of the air; gout is not. In the long run of the disease we can have atrophy in rheumatism, in gout we have necrosis from the start. In rheumatism the destruction of leucocytes plays hardly any part, in gout it does most conspicuously. In rheumatism we have agencies, probably ferments, of purely peripheral origin, like cold or auto-intoxication from lymphostasis with their tendency upon the connective tissue to produce fibrinous masses; in gout we have to deal with direct poisons, which destroy the leucocytes and liberate nucleinic acid. This is a fact proven by experience and experiment. Lead is demonstrated by experience to cause the same tissue necrosis with following precipitation of urates as gout. Ebstein produced the same phenomena by injection of chromic acid. We have only one pathologic process, which can rank with that of gout, I mean atheroma of the intima of the blood vessels. There we meet with the same tissue necrosis and following atrophy, only we find instead of urates calcium precipitated into the rough necrotic surface, probably caused by the surplus of calcium in the blood, which in the age when atheroma occurs is no more needed for the building up of the osseous skeleton of the body. Never did a scientist and prominent authority himself utter a more truthful word than Sternberg did when he said that nothing impeded the progress of science more than blind thoughtless following of so-called authorities. Bouchard injected 64 centigrams of uric acid per kilogram of living weight into rabbits, to investigate its toxicity and comes to the conclusion that we can never introduce into the veins of an animal more uric acid than in his first experiment (250 centigrams to 0.641 kilogram), since the doses of uric acid would saturate a quantity of water which of itself is toxic. Yet we meet with recent publications where the toxicity of uric acid in the uric diathesis is the cause of all kinds of auto-intoxications. If asked the cause of this intoxication we get again a big word for an answer, which is meant to say much, says nothing, the leucomains. We have harmless as well as noxious leucomains, but the main excrementitious poison of our intratissue respiration, the carbonic acid, which through strain in the parenchymatous lymph current stays too long in contact with the tissue cell, killing its ameboid function and provoking from the connective tissue in defense of the cell proliferations, never is alluded to.

We have seen in Fraenkel's exquisite observations that in acute leucemia the marrow of the bones is diseased, the epiphyses swollen and painful. The leucocytes do not reach their full ripe stage and fall to destruction without causing tissue necrosis. In gout we do not notice these changes in marrow and epiphyses. We have an acute feverish though a septic inflammation localized within certain places of predilection, cartilages, tendons, etc., where circulation is naturally slow. We must deduct from this phenomenon that in leukemia the undeveloped mononucleated leucocytes, which lost the ameboid motion, and with it their ability of development, decay in a place where the alkalescence of the tissue is so powerful as to neutralize the tissue-destroying ability of those agencies at once, which are liberated through the chemic act of decay. That is after they have passed their breeding places and reached the free current of the blood.

In gout it is quite different. There the destruction takes place in certain places, which show the effect of the chemic action of the destruction which has taken place there in tissue necrosis. As these places have a naturally slower circulation and the plasma there accumulated is limited, we have certainly to accept the consequences of the fact, that

the noxious agencies, which are liberated through the decay of leucocytes, remain in longer contact with the tissue, and as the alkalescence of the present plasma does not suffice to neutralize these agencies, they as a matter of course corrode the tissue, cause necrosis, and the uric acid, which originates at the same time, precipitates upon the rough necrotic surface. What is this noxious agent? It must be an acid, and as only one acid appears in this chemic process, the nuclein acid, it must be this acid. Nuclein acid dissolves living tissue if this is exposed to it. It remains to explain what causes the destruction of leucocytes in gout, why does this destruction take place in those places of predilection and cause that destruction and not within the blood, as it does in leukemia? In leukemia the destruction takes place owing to the innate weakness, the undevelopment of the leucocytes. In gout we meet the same mononucleated leucocytes, though not to the same amount. We can explain their presence through the etiologic fact that the habits of those persons, their irregular meals, taken too often and too much of it at the time, are bound to produce a more or less continuing leucocytosis, the hemopoetic organs are subject to permanent activity, the leucocytes are not given the time for full development and the organs of their production put them out in a decrepid, mononucleated condition. But nevertheless they would not decay before they reach the general current of circulation if they did not meet on their way there an agent which provokes their destruction already within the cartilage, etc. In lead poisoning they come into contact with this mineral poison; in those cases of gout, which are not due to lead poisoning, there must be another poison. What might that be? There is one powerful poison, produced through the intratissue respiration of our body. If the circulation is impeded and accordingly this poison instead of being rushed away is left in longer contact with the tissues and may and probably does cause destruction of leucocytes in gout on their way to the general circulation, that is probably carbonic acid.

Carbonic acid, produced in intratissue respiration, is ejected with certain leucomains from the parenchymatous cell to the surrounding lymph spaces and from there through diffusion or action of endothelium, or both, through the venous capillaries. A stasis within these lymph spaces of course impedes this action, the carbonic acid stays there longer and is allowed to exercise its toxic influence upon everything it comes into contact with, especially decrepid leucocytes. That in goutic patients we have lymphostasis owing to their want of exercise and overfeeding is certain, and can be demonstrated if the lymph current is accelerated through a laxative, which causes at once a mitigation of all symptoms of the gouty attack, and that the gouty attack takes place where there is already a natural disposition to lymphostasis is another affirming factor.

Intratissue respiration is without any doubt the most potent factor for preservation of the physiologic integrity of all our organs. A. Poehl (*Zeitschrift für klin. Med.*, 1894) of late made it the object of his investigations in connection with the effect of organic extracts, which he says, especially spermin, cause in dissolved condition, intratissue respiration, acting like a ferment. The products of regressive metabolism, the leucomains, he continues, are those nitrogen-holding products of regressive metamorphosis, which are oxidized into so-called intermediary products instead of urea. The accumulation of these leucomains causes autointoxication, and the most common kind of autointoxication he declares is caused by reduced tissue breathing. Spermin, a nuclein found in testicles, ovaries, etc., has oxidizing power, but only in dissolved form; in presence of phosphates it turns insoluble, inactive. (Charcot-Leyden crystals.) In tissue which is passed by normal alkalin blood no insoluble phosphates can form, reduced alkalescence of blood is the essential moment of inactivity of spermin and its formation can be explained as follows:

Any nerve or muscle tissue if irritated decreases its alkalescence and can be brought to acid reaction, and as phosphates always are present the moments of spermin-phosphate formation with acid reaction are given. Under normal conditions no inactive spermin phosphates are found, because the passing normal alkalin blood prevents it. Reduction of the alkalescence of the blood favors its formation and continuing irritation of tissues can reduce the alkalinity of the passing blood, which again causes formation of inactive spermin. He thinks urea is a special product of aerobic tissue life and goes parallel with intra-organic oxidation and explains the vacillations of the production of uric acid, that it depends upon the circumstance whether the destruction of the nucleins proceeds in a more or less alkalin or acid medium. If this destruction takes place in alkalin medium the spermin will remain active and the oxidation to urea goes on normally, but if it takes place in an acid or reduced alkalin medium, then through splitting off of phosphoric acid insoluble spermin phosphate is found, which reduces the oxidation process and uric acid accumulates.

This is a very captivating and ingenious theory, only it does not hold good in gout. It may be the cause of neurasthenic troubles, but even then it would not explain the long duration of such chronic ailments, even if the formation of insoluble spermin were the cause the current of the blood would in less than no time remove it and replace alkalin reaction, and even if lymphostasis should be present enough alkalin plasma would pass through to reëstablish the normal. Uric acid is not in gout increased through retention, but through hypoleucocytosis, which followed by leucocytosis produces first decrease, afterward excess of uric acid, not only relatively to the present urea, *but absolutely*. Uric acid, furthermore, is generated through decay of leucocytes and not a lower oxidation of food, which always is oxidized to urea. Another very important factor against Poehl's theory is the circumstance that the curative effect of spermin in those ailments, which he praises so highly because of intense and rapid effectiveness, fail to give other investigators the desired and promised results. We therefore sum up our answer to question No. 2 as follows:

The tissue necrosis in gout is caused by a poison, probably nuclein acid, sometimes lead; the uric acid in gout is generated by decay of leucocytes, which destruction is brought on probably through carbonic acid. The reduced amount of uric acid in the beginning of the gout attack is parallel with hypoleucocytosis, the following increase with leucocytosis.

Treatment.—If ever we succeed in establishing the true physiologico-pathologic basis of a disease, it will naturally be followed by the indications of a real physiologic treatment, and the adoption of the latter will culminate in its success in praxis. So it is here. The

treatment which I have built up upon the above facts has proved superior to any other and a success throughout.

Prevention.—We have to convince the patient of the absolute necessity to regulate his habits. Two light meals and one substantial one every day, almost to the minute, at the same hour. Never eat so much that you could not again sit down to the table and eat more. No cheese or eggs, no brains, sweetbreads, liver or kidneys; light wine, if any alcoholics. This will reëstablish regularity in the periodic leucocytosis, and regularity in this act will again strengthen the hemopoetic organs and enable them to turn out vital leucocytes. Passive and active exercise sufficient to agreeably fatigue the body, but never so much as to provoke exhaustion, this is especially to be avoided. Massage daily, not by a so-called professional masseur, but by a physician who makes this treatment a specialty. The professional masseur gives everybody the same general, more or less superficial, massage. This is good enough for a business man who substitutes this treatment for exercise, but it will never do where intratissue respiration has to be influenced. I do not mention this from personal motives, *pro domo*, because I limit my practice to this kind of work; I had to do it because I did not find satisfaction with the work of these masseurs. Especially the powerful muscle layers of the body have to be worked and emptied of their lymph down to the periosteum of the underlying skeleton, and in gout especially, those parts have to be well taken care of, which, on account of their retarded circulation are predisposed to localization of gout.

Alkalin mineral waters, if recommended, ought to be taken hot. The only effect of the lithia waters consists in their being substituted for alcoholic drinks, which still is a fact in their favor. I only mention here an experience I had with a patient whom I sent to Hot Springs, Ark. She suffered from rheumatic hemiplegia, but no one suspected her of being subject to lithiasis. Whenever she went there and drank the hot water, for the first few days she used to evacuate immense quantities of gravel. She drank for months lithia waters, *ut aliquid fiat*, without any effect. I ascribe this effect to the small proportion of alkali in those springs, which, especially if taken hot, approach more the real physiologic conditions. I recommend douches alternately with hot or cold water (Scotch douches).

Treatment of the attack.—We have to treat the attack locally, because gout is a local disturbance caused by poisons suspended in the blood, and generally to eliminate these poisons from the blood.

The general treatment has to be directed toward the change of the reduced alkalescence of the blood and strengthening of the blood corpuscles. Adherents of the old school of course would forbid anything acid, fruits, salad, etc., on account of the alkalescence of the blood. I am only glad in the interest of the welfare of these patients and of the promulgation of the principles of digestion, that they will never succeed in keeping the stomach from producing hydrochloric acid, they may envelop humanity in as much sweetness as the please. To strengthen the blood corpuscles we have in diluted hydrochloric acid a very good medium, it is an agreeable drink and can be taken oftener during the day. To remove the poison from the blood, we have only one way, that is a good old-fashiond bleeding, which may be repeated according to the condition of the patient, especially if lead poisoning is apparent. Bloodletting should not be limited to the pocketbooks of our patients, it is a harmless remedy, as the removed blood is restored in a few days, and is the most powerful means of changing the condition and composition of the blood by its enormous influence upon the hematopoetic organs to more energetic and more extensive activity. The experience of our grandfathers, which praised this proceeding even in those persistent cases of chlorosis in apparently well nourished individuals, we know now to be based upon the fact that the bloodletting removes the numerous decrepid mononucleated cells and replaces them with more vigorous corpuscles. I can not make a plea strong enough for rehabilitation of this remedy, the interdict against which I contemplate as one of those modern windmills, which have to be fought. Of course its use has to be left to the discretion of the physician.

To increase the alkalescence of the blood we might apply the lymphagoga, which Heidenhain introduced. The extracts of crab-muscles and leech heads seem to be varying in their efficacy.

Of all the lymphagogas cinnamon acid is the most reliable, the most rapid and the most harmless, but as the physiologic effect of all these medicines is connected with and based upon leucocytosis, I preferred to do without it, as just in gout too often repeated leucocytosis seems to be the main cause of the deficient development of leucocytes. Still, in cases where the kidneys or other organs are effected, which we can not reach by local treatment, lymphagogas could be the only way to increase the blood's alkalescence at once.

The local treatment is the most important, and in its effects the most effective. We are accustomed to regard a surgical treatment of the local precipitation of urates, the tophi almost as sacrilege. They play the part of foreign bodies in our system, and each foreign body, if accessible, ought to be removed and we should thank Heaven in the interest of our patients, if there are any surgical means to treat their ailments. There is so much talked and written about dissolving these urates with lithium salts, piperazin and of late lysidri. They work very nicely in the reagent tube with water, but as soon as we take urine, the dissolving effect stops. How it works in plasma, I don't know; if these agencies are locally injected in a concentration strong enough to take effect, that the resulting chemic process causes a painful inflammation, which lasts almost two days. The only way to remove these tophi is curetting under asepsis, it ought certainly to be done in each case during the time no acute attack is apparent.

Another way to cut off an attack is the neutralization of the nuclein acid with a very diluted solution of bicarbonate of sodium. It is injected peripherally from the inflamed section hypodermically,and tenderly massaged over the whole part. It can be preceded by an injection of cocain. My experience is that this local treatment is really abortion, it cuts off the attack within a day or two. Connected with these locally intended alkalin injections the same solution might be injected in larger quantities underneath the skin, certainly the best way to influence the alkalescence of the blood.

As a matter of course the free action of the bowels is the first thing to be attended to in an acute attack of gout, it has a sudden effect upon the lymph motion

and through this accelerates the access of alkalin blood to the inflamed districts.

Our views of disease at present are in a stage of transition, the inherited slab bones are found to not fit anymore and if several diseases are discovered to present one identical pathologic phenomenon, they are thrown together heterogeneously as they might be. Loewitt observed what he calls leukopenia in rabbits with rapid sinking of temperature as soon as they were exposed to shock; another repeats the same experiment on turkeys, with the same results, finds leukopenia in neurasthenia (a totally arbitrary classification of morbid symptoms, which accompany many entirely different diseases) and says that leukopenia is the cause of neurasthenia, because we notice the same morbid fears there. Since excessive formation of uric acid has been discovered in many other diseases besides gout, Haig and others subject almost every chronic ailment to the uric diathesis, it has seemed to me therefore necessary to show that uric acid has no toxin effect and that its presence has directly nothing to do with the apparent disease. We have to go back to the generation of uric acid, to the poisonous noxes, which create uric acid, and there we find that gout is a disease *per se*, it has nothing to do with rheumatism or other diseases, we are able to distinguish it clearly from that whole mass of confused conception and substitute for its treatment a really physiologic basis.

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THE USE OF THE CURETTE IN THE TREATMENT OF ENDOMETRITIS.

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Endometritis, for the purpose of discussing the use of the curette in its treatment, is best divided into three varieties—catarrhal, septic and gonorrheal.

Catarrhal endometritis is the form of pelvic disease most frequently induced by improper habits of life, consequently the one most amenable to constitutional or medical treatment.

A large percentage of cases occur in unmarried women. In the society girl it is produced by the nightly exposure of the arms and a large portion of the chest, whereby the blood is driven into the interior of the body, congesting the uterus along with other organs; the tight corset, displacing the abdominal organs and interfering with the action of the heart and lungs; the numerous meals at irregular hours of stimulating and indigestible food, the position assumed in dancing and the exposure and lack of rest during menstruation.

In her less fortunate sisters, the school teacher and the shop girl, the constant standing serves as an efficient exciting cause.

Another cause, I deem of importance, is unsatisfied sexual desire. Genito-urinary surgeons tell us this is an important factor in the production of hypertrophy of the prostate, which is a condition in the male somewhat analogous to fibroid tumors of the uterus in the female. We all recognize the fact that this latter affection is a penalty frequently paid for celibacy. If it produce this graver result of persistent uterine hyperemia it is fair to suppose that it will also produce catarrhal endometritis.

The cause of the disease having been recognized, the proper treatment suggests itself. The faulty habits must be, as far as possible, corrected. If the patient is anemic, iron, quinin and strychnin between, hydrastis and hyoscyamus or cannibis indica during the menstrual periods. An occasional mercurial purge is always indicated. While the symptoms are acute and exercise gives rise to pain, rest in bed should be enforced; later the patient's mind should be diverted from herself and her disease and healthful exercise in the open air, horseback riding, bicycling, etc., are of the greatest value. A change of climate, particularly a residence for some time at mineral springs, is beneficial. These measures faithfully used will cure many cases, and they should always be employed before resorting to any local treatment in the unmarried. I wish to protest against the growing tendency to curette every girl that has a little leucorrhea and menstruates a day too long or with some pain.

If these measures fail the curette is indicated. It is much to be preferred to prolonged office treatment.

In married women the objection to local treatment does not exist, and in the majority of well-marked cases curettement is the appropriate measure.

It is true that a large number of this class of cases can be cured by office treatment. Drainage of the uterus secured by gauze, application of carbolic acid and iodin to the endometrium, bleeding the cervix, correction of mal-positions, etc., will in time effect cure, and there are cases where it is advisable to proceed in this way. Where existing disease of the heart or kidneys makes it unsafe to use an anesthetic, or where the patient will not readily submit to an operation, the gynecologist may prefer this method of treatment. To the general practitioner who desires to treat his own cases it will usually commend itself, for lack of operative experience makes an aseptic technique well nigh impossible for him to attain, and without there is some danger in the operation.

The severer forms of the disease can not be cured without curettement. Nor will curettement alone cure all of them, but curettement combined with such other local and constitutional measures as are indicated will.

It may be necessary to repair a lacerated cervix, or perform an anterior or posterior colporraphy, or both. Or an Alexander operation or suspension of the uterus may have to be done, for unless the circulation in the uterus can be restored to its normal condition, no relief of the symptoms will be permanent.

Septic endometritis usually follows abortion or labor at term, and this phase of the subject will be discussed by my friend, Dr. Mitchell; but it may follow the introduction of an unclean sound or operation upon the cervix; it may also develop during menstruation by infection from germs existing in the vagina. The curette with antiseptic irrigation should be used as soon as the diagnosis is made. Where there are stitches in the cervix they should be removed. If this treatment is instituted sufficiently early, it will generally give relief and obviate the necessity of later resorting to more dangerous surgery, that, even if successful, leaves the patient mutilated.

Gonorrheal endometritis when seen in its incipiency can usually be cured by intrauterine irrigation and gauze packing, provided the disease be vigorously attacked at the same time, wherever else it may have found a lodging place, in the vagina, the urethra, the glands of Bartholin.

But if it has been in progress some time when it

comes under the physician's care, or if after a faithful trial of these measures it fails to yield, curetting is indicated, no matter whether the symptoms are acute and alarming or chronic, the only contraindication being a palpable accumulation of pus in or around the appendages. When this condition exists the pus should if possible be evacuated through Douglas' cul-de-sac; if this can not be done an abdominal section should be made for its removal, either operation being immediately followed by curetting.

Technique.—We are to have a special paper on this branch of the subject, so I touch very briefly on but one or two points. Before curetting, the uterus should always be thoroughly dilated. For this purpose I prefer the Goodell-Erlinger dilator and always work it with the hand, never with the screw, and make the pressure intermittently, as does Dame Nature when she dilates the cervix in parturition. Believing that in this way the cervix is less apt to tear, and if it should do so the force can be released before the tear progresses far. The sharp curette is the only instrument of any value in these cases. The sizes needed are the smaller to enter the horns of the uterus, the larger to more rapidly and with greater certainty go over the walls in their entirety. The curetting should be continued till at every point the operator can feel firm tissue and hear it grate under the instrument. The uterus should now be mopped out with a strong antiseptic, dried with absorbent cotton and packed with iodoform gauze tight enough to prevent any oozing of blood. In catarrhal endometritis this packing may be allowed to remain for from seven to ten days if there be no elevation of temperature. In septic or gonorrheal cases it is wiser to remove it in forty-eight to sixty hours, irrigate the uterus and loosely repack it. If the tight packing cause painful uterine contractions they can be relieved with codeia and hyoscyamus. Patients who have been curetted for endometritis should be examined a few weeks later, and if there is still some discharge issuing from the uterus, the endometrium should be treated with iodized-phenol twice a week. If this does not give entire relief, the curetting should be repeated. In some cases even the third operation is required. The accidents incident to the operation are laceration of the cervix, perforation of the uterus and rupture of an abscess adjacent to the uterus.

Laceration of the cervix can usually be avoided by following the method of dilatation indicated above. If a laceration of any extent take place it should be sutured at once.

Perforation of the uterus is an accident that has happened one or more times to almost every operator of experience. A soft cervix from which the vulsellum is inclined to tear, would put the operator on his guard. In two cases in which I have met with this accident I noticed afterward that the cervix was unusually friable. One of the cases had never been pregnant, the other had borne two children, the youngest of which was 16 months old. Both recovered without untoward symptoms. When the uterus has been perforated it will not be irrigated or swabbed out with strong antiseptics. It may be wiped dry with sterile absorbent cotton, and packed loosely with iodoform gauze. If the uterus was pretty thoroughly cleaned out before the perforation was made and the operator recognizes what he has done recovery is to be expected.

If one has good reason to suspect he has ruptured a pelvic abscess into the peritoneal cavity, the proper procedure is an explorative abdominal section, and if his suspicions prove true he will flush and drain.

DISCUSSION.

Dr. PALMER—I do not know that I ought to speak upon this question, since I have designed two of the instruments referred to tonight, the dilator and the curette, and it might be too personal for me to speak upon the matter just now. I will, however, make a few remarks upon the propriety of using the curette.

There can be no doubt about the curette being an exceedingly valuable instrument. It is valuable in many cases of abortion, those cases, for instance, which we technically call "incomplete" abortions, in which some portion of the ovular tissue is retained, and these remnants give rise to trouble, sepsis and hemorrhage. Now, when the curette is used under such circustances the instrument should be as large as can be put inside of the uterine cavity. The cervix is generally soft and relaxed and a larger sized instrument will usually go in than one would think. For an abortion which occurs at the most common time, some time along about the third month, the curette should be somewhat scoop-like in shape, smooth, blunt and not sharp. What we want to do is to remove any of the ovum that is retained, all the retained forming placenta and the decidual structures, but none of the genuine mucous membrane. In other words, we do not want to use any force but gently pass this kind of a curette from the fundus down, taking perhaps more care in going over the posterior wall and the horns of the uterus. But we never ought to use it with any degree of severity and never when it is sharp, as we ordinarily do employ the curette for certain gynecologic affections.

About twelve years ago the subject of the employment of the curette came up before this society at a meeting held at my house. I think I was the only one then who advocated the use of the sharp curette in gynecologic practice, and for this I was criticised pretty sharply. Now almost everybody employs the sharp curette. The dull curette, as a rule, is employed in obstetric and the sharp curette in gynecologic work. It is my practice ordinarily to dilate the uterus when the curette is employed for gynecologic purposes, but, as I have said, this is not necessary when the curette is employed for obstetric purposes. I am in the habit, usually, of washing out the uterus with the reflux tube before curetting. Before I stuff the uterus with some antiseptic gauze I generally again wash the cavity out with some hot antiseptic fluid.

Dr. STARK—In the first paper presented this evening a statement was made, that the further advanced in pregnancy the less is there a necessity for the use of the curette, and the essayist attributed the cause for this to the fact that the muscular structure of the uterus had become hypertrophied and its expulsive power had become thereby increased. I am inclined to take exception to this view. I believe the greater necessity for the curette early in pregnancy than late may be attributed to two reasons. During the first two months of pregnancy the ovum is covered over its entire surface with chorionic villi, and the attachment to the uterus is so extreme as to prevent the separation of the chorion in the expulsion of the ovum. I have seen ova expelled, and have no doubt others have, whose outer covering consisted only of the amnion. Another reason is that you do not have the same changes at this period which takes place later, namely, fatty degeneration of the sub-decidual stratum. In many instances also, the decidua vera is thrown off in large pieces, after seemingly the whole ovum has been cast off. That is, where the ovum is surrounded with the chorionic villi, you subsequently have clots expelled containing large pieces of the decidua vera, and this is due to its primary non-separation. And I believe, also, that we are able to cure many cases of true septic endometritis by the use of the curette. The reason for this is that we

remove the source of the lymphatic inflammation, in the same manner as we are able to cure a lymphangitis of the arm by disinfection and drainage of an infected hangnail or felon. In regard to the treatment of gonorrheal endometritis by the use of the curette, I am thoroughly opposed to it. I do not believe it is scientific. I think the very fewest of such cases are cured. We all know that men who have had gonorrhea come to us years afterward and complained of a slight gleety discharge in the morning, and if we examine the discharge it is free of gonococci; but, if we pass a sound and repeat the examination in a few days the discharge is very often purulent and full of gonococci. I remember when I was studying in Breslau I saw a case in which a woman gave birth to three children, each born with ophthalmia neonatorum. The lochial secretions examined were full of the gonococci. After the lochia had subsided, there were no gonococci. It has furthermore been shown that the discharges from the uterus just prior to and shortly after menstruation contain gonococci, while in the interim the secretion is free from the gonococcus. The mucous follicles of the uterus extend between the muscular bundles, and down there you will also find white corpuscle infiltrations which contain the gonococci, and make it impossible for the curette to remove the infection. All you can do with this procedure is to stimulate the germs and further their growth. And that has been my experience in practice, too. I would never think of curetting a case of acute gonorrhea, and the chronic cases which I have curetted were worse afterward, and in one I know I induced a purulent salpingitis.

Dr. PALMER—In those cases, in which you did not think you got good results, was there any perimetritis?

Dr. STARK—Not evident, but perhaps there was some latent perimetritis. I believe there was some latent trouble there beforehand. But I am referring to cases of pure and simple gonorrheal infection. After the curettage and other associated treatment the discharge is more profuse and the gonococcus is developed into activity and multiplies.

Dr. E. W. MITCHELL—Dr. Stark is correct in saying that the changes which take place in the decidua and in the development of the placenta are the chief factors in the more thorough separation of ovum and secundines as pregnancy advances. In speaking of the greater development of the *musculature* I had in mind the more prompt and thorough evacuation of the contents. I purposely said little about the technique, as Dr. Jones was to consider that subject especially.

I must confess that I have not been able to clear out the uterus with the fingers with the facility some of the gentlemen claim, although I have tried it many times.

SPECIFIC MEDICATION IN TUBERCULOSIS OF MAN AND BEAST.

Written for the Mississippi Valley Medical Association at St. Paul, Minn.

BY PAUL PAQUIN, M.D.

ST. LOUIS, MO.

Specific medication in specific maladies is now recognized as the objective point of medical research. Whatever the means employed, the course of events and the processes to that end, the object sought is the all-important question. The men who have, or do now, play a rôle in the endeavors of medical science, no matter how divergent their opinions may be, no matter how inharmonious their relations, results and manner of work, are only instruments for the accomplishment of a great task, and their personality and differences, as in all processes of evolution, are insignificant and inconsiderable as compared with the achievements sought for the benefit of mankind. Conflicts of intellects are as essential factors of medical evolution as are conflicts of intellects in other spheres of civilization. As long as carried on in the broad, manly spirit that characterizes the man of truth, evidence and knowledge of cause and worth they will always receive attention from thinkers and honest delvers, and in the end must command respect, whatever may be the temporary influence of selfishness, greed, malice, commercialism and speculation, in the ranks of the original investigators or their followers and imitators, unfortunate conditions which of late are not wholly absent factors in the dissentions and retarding circumstances in medical science.

The study of the effect of antitoxin on the tuberculous phenomena in human beings, leads us back to the active principle underlying immunization, to-wit: the special agent which is itself curative to a degree, by virtue of its power to provoke the formation of a defensive force in the system. When Koch declared, publicly, for the first time, that the toxins produced in the culture of the bacilli of tuberculosis had a certain specific effect on the lesions of lupus, he did not explain what existed in tuberculin that could cause the modification. In fact, it seems that it was not then understood. We know now that it was because the tuberculin (or bacilli culture toxin) used by hypodermic injection in the patient suffering from lupus, provoked the formation of the antagonistic agent in the blood and tissues of the individual, which is now known as antitoxin, a name which is the general designation of nature's own remedy in the cure of microbian maladies. Tuberculin then is, to a degree, capable of modifying certain forms of tuberculosis, because it forces the affected organism to produce a certain amount of tubercle antitoxin. The inconvenience of it, from a practical standpoint, consists chiefly in the more or less severe reaction which follows the injection in the already seriously ill patients, and in the fact that in certain stages of certain forms of tuberculosis, particularly of the lungs, it seems to hasten the breaking down of tissue. It is claimed now that tuberculin, under other names, brought forth through the efforts of the Klebs school, may be so modified as to be free from the poisonous principle or principles. This theory seems supported by numerous animal experiments of Klebs, particularly in guinea pigs. Series of these have been published, and if we are to credit them as the reputation and scientific standing of the learned German in this country suggests, tuberculin, under its new name, deserves careful consideration. But if devoid of toxic principles, modified tuberculin (whether named tuberculocidin or antiphthisin) as curative or immunizing agent is not free from grounds of criticism involving the very structure upon which the modifiers of Koch's original discovery have sought to erect a school of therapeutics in the treatment of tuberculosis. In the first place, the only thing that science can possibly suggest as curative in tuberculin is its very power of provoking the formation of antitoxin in the affected and thereby a degree of immunity. Now what is the agent that forces nature to produce this defensive power? It is precisely the principle that *causes poisoning*, the principle that causes the fever and destruction, without which deleterious effects there would *occur no* demand on the injected body for the production of a defensive force. So it is that, notwithstanding the numerous animal experiments of Klebs (denied or not very well supported by other experimentalists) which seek to establish positively and definitely the therapeutic value of modified tuber-

culin, we find ourselves compelled to doubt their efficacy. In these days, when the ultra-progressive physicians clamor so loudly for experimental evidence in animals, of results obtained in man before accepting the latter, it would seem that the apparently brilliant results of Klebs in experimental tuberculosis would settle the fact that antiphthisin is indeed almost a perfect curative preparation. But unfortunately the results in man, except under the direction of the originators and controllers of the remedy, do not support the claims of the experiments in guinea pigs, as numerous and as thorough as they are pictured, and upon which I do not wish to reflect discredit.

On the other hand comes numerous reports by numerous physicians, abroad and on this continent, in which is proclaimed the value of sero-therapy in tuberculosis, but which fail to support their claim by animal experiments, fully, in all the physiologic and pathologic details that are demanded by the profession, and yet they bring forth proofs of unmistakable recoveries of tuberculous patients. Not one of the experimentalists and investigators abroad and in America has succeeded in proving, with all the delicate niceties of Klebs in his work, that antitubercle serum cures tuberculosis in man because it positively does so in guinea pigs or other small animals. Noting the definite and positive results in human beings, they have seemingly neglected the animal experiments which are today demanded as a crucial test that serum can cure tuberculosis in man. But if apparently neglected, let me say to you that the laboratories interested in the question have not been idle. From the humblest to the greatest, there has been conducted experiments for a long period on this very point, and if the workers in that field are few who have dared to publish results and pronounce them reliable, it is not because of dearth of them, but because they realize the exceeding delicacy of the work and the numerous fallacies and deceptions that follow apparently proven problems in laboratory investigations concerning tuberculosis. The unequal sensitiveness of guinea pigs and rabbits to tuberculosis and the tox-albumin of the germ structure, the excessively rapid development of the tuberculous phenomena in some of them when inoculated, have been factors which have made curative measures uncertain and the results often vague and valueless. It is not true that one can always interpret properly the results of any form of treatment in experimental tuberculosis in small animals, and apply them to man as a reliable guide in therapeutic expectations. This claim which the profession wants demonstrated before accepting serotherapy in tuberculosis is made by the rash or inexperienced, not by the careful and conservative, who have delved the longest in the problems in question.

Experimental tuberculosis in the guinea pig and accidental tuberculosis in man, so far as the nature and effects, locally and generally on the system, and the rapidity and fatality of their development are concerned, offer very different conditions to deal with in treatment, which should not be forgotten by those who must have animal experiments today to confirm the assertion of a competent physician that a man who has been cured a year ago is really cured.

However, animal experiments are indeed a necessity in the prosecution of the task undertaken by several to demonstrate the value of serum in the treatment of tuberculosis. The results thus obtained, both positive and negative, are scientific beacon lights of great importance—indeed indispensable, both with respect to the immunization processes, and in the domain of therapy.

My own very imperfect work in the study of tuberculosis dates back several years, and my first efforts in the line of therapy in experimental tuberculosis in small animals began during the period of the furore that followed Koch's famous pronunciamento on the action of tuberculin in tuberculosis. With plenty of material, I carried on at the State University of Missouri, tuberculin treatment of several series of guinea pigs and rabbits for a long period, with indefinite, unreliable results, although fruitful in the varied information gained in so-called experimental medicine.

My experience with serum in experimental tuberculosis is much more recent, and was almost concomitant with tests of the same nature in man. Without facilities, the small animals inoculated with tuberculosis and afterward treated with serum were very few until this year, when several series have been used in different experiments, many of which are still in progress.[1] For the purpose of this occasion I shall mention, in figures only, the results obtained to date with serum in man and beast.

In guinea pigs 10 per cent. of the subjects inoculated with tuberculosis and then treated with serum from horses immunized by the use of only pure tuberculin were saved; rabbits, by the same treatment, 8 per cent. This was early in our experiments and indicated a meagre therapeutic value in serum—since, we have produced serum of much greater potency by using not only tuberculin in producing the immunity of the horse but also the tox-albumin of the dead virulent bacilli and even living cultures, as will be seen further. Experimental tuberculosis under various circumstances was arrested with this serum in from 25 to 55 per cent. of cases, according to stages and lesions. In man the results of sero-therapy in 226 cases of tuberculosis, reported with sufficient details to form a fairly accurate judgment, were as follows:

PULMONARY TUBERCULOSIS.

		Number of cases.
Class 1.	Destructive Bronchopneumonia and cavities	37
Class 2.	Destructive Bronchopneumonia without recognizable cavities	66
Class 3.	With diffuse Febrile Pneumonia with or without a destructive process	19
Class 4.	With diffuse Non-Febrile Bronchopneumonia with or without destructive cavities	19
Class 5.	With circumscribed Febrile Bronchopneumonia	35
Class 6.	With circumscribed Apyretic Bronchopneumonia	13
	Diagnosis not reported clear enough for classification	32
	Hip Joint Tuberculosis	2
	Laryngeal Tuberculosis	2
	Ovarian Tuberculosis	1
		226

In every one of these cases the diagnosis was verified microscopically. During the treatment of these 226 cases the following results obtained:

				Not Recorded.
Effect of Serum on Fever, Subsided, 60; Reduced, 56; Stationary, 26				84
Effect of Serum on Night Sweats, Ceased, 69; Unchanged, 17				140
	Increased	Unchanged	Decreased	
Result of Serum on Weight	125	15	27	59
Result of Serum on Strength	154	9	24	39
Result of Serum on Appetite	114	15	—	—
Effect of Serum on Local Signs, Disappeared, 46; Mitigated, 58; Unchanged, 29				94
Effect of Serum on Tubercle Bacilli, Disappeared, 40; Reduced, 103; Altered, 7				76
Effect of Serum on general well-being, Exclusive of 40 cures, Improved, 145; Unchanged, 9				82

[1] The report on these will form the basis of a paper which I sha have the honor to read before the Chicago Medical Society, within short period. In this paper scientific details shall be given.

Number of recoveries that seem complete and permanent	40
Number of apparent recoveries with existing lesions in statuo quo	3
Number of improved, capable of performing usual duties	41
Number of improved to a lesser degree	69
Number of deaths reported	32
Number of cases disappeared from observation or under various treatment	41
	226

As to pulmonary cases, the extent, stage and importance of the conditions at the beginning of treatment were as follows:

In class No. 1 there were	20 cases in advanced stage;	3 in early stage.
In class No. 2 there were	33 cases in advanced stage;	6 in early stage.
In class No. 3 there were	12 cases in advanced stage;	0 in early stage.
In class No. 4 there were	9 cases in advanced stage;	0 in early stage.
In class No. 5 there were	12 cases in advanced stage;	3 in early stage.
In class No. 6 there were	7 cases in advanced stage;	1 in early stage.
	93	13

Unclassified accurately enough for satisfactory description, 115. These ranged between the first and third stage of a variety of classes.

Now as to the immunization process and the necessity of measuring the antitoxic value of serum in units, as for diphtheria antitoxin, as it is asserted Maragliano gauges the serum he uses.[2] I shall, only touch upon these points here. First: Immunization of the horse or other animal, is produced more or less completely by injections of tuberculin, and intensified by injections of tox-albumins and may be still exalted by injections of living cultures in the circulation; the whole period of daily or alternate daily injections covering three to six months, sometimes more. The less natural immunity an animal possesses, the greater the value of the antitoxin produced by artificial immunization. The antitoxic value may be measured by the physiologic neutralizing power of a given quantity of immunized serum on a toxic dose of tuberculin and tox-albumin in a given weight of guinea pig. Notwithstanding assertions to the contrary, among scientists considered authorities, and the very flattering comments of the American medical press thereon, the measuring of the value of therapeutic serums is not yet as reliable in practice as is that of diphtheria antitoxin. Among the causes which vitiate the application of Behring's law in tubercle antitoxin is the fact that healthy guinea pigs of the same weight respond differently to a given dose of tuberculin and tox-albumin of a given culture, and consequently the very basis of unit measurement is not absolutely uniform. On the other hand, the unit measurement has little practical value as a guide in dosage in therapeutics, because of the very numerous different forms of tuberculosis, the lesions present, the complications, the susceptibility of patients, and the more or less pronounced general effects on various important systems of organs in the affected, which are not subject to neutralization by tubercle antitoxin.[3] The unit of measurement, however, is desirable and should be in vogue as far as it is practicable and no pains should be spared to render it more thoroughly reliable and useful, if for no other purpose than that to establish a standard of defensive power as uniform as possible. This year's series of animal experiments includes researches on that line and if I have been slow in using the facts accumulated and marking the bottles of our serum with a unit measurement, it is because no one realizes more fully than I do the uncertainty of experimental work in tuberculosis and that I must back my conclusions with a voluminous list of reliable results, which the critics of competence may duplicate and the pretenders in medical science can not refute successfully by mere quibbling or disputing statements, malicious reflections, or meager and untrustworthy experiments.

Foreign investigators assert the reliability of their unit of measurement. As yet the assurances have not been confirmed by other than assistants of the originators of the systems, although our American medical press has with avidity accepted their statements on this point, as on all others, as being infallible, granting to investigators of our own country much less comfort, even though they present equally good results.

The earlier treatment is begun the better the chances of recovery. It is essential, therefore, that we leave nothing undone to advance our knowledge of the earliest diagnostic signs of tuberculosis, in order that we may begin treatment very early when most cases may be saved and that we leave no stone unturned to increase the power of serum.

Anti-tubercle serum is positively curative and has passed the experimental stage, but it is far from perfect. In our reports we respectfully submit the good, bad and indifferent results. The basis of the reports are on file in our office and subject to the scrutiny of any honest physician, just as we open to him every department of our laboratories. From the experience of others and my own, it will be observed that only a relative number of tuberculous patients can, with our present knowledge of tuberculosis and anti-tubercle serum, be treated successfully. The very fact that many cases of different kinds have been cured by the exclusive use of serum in bad climates proves its curative properties. If it does not succeed it is because of existing conditions such as intolerance to serum injections of any kind, which is very rare; general destruction of physiologic equilibrium beyond repair; incurable lesions; mixed infections, etc. As to mixed infection, I am glad to say that a serum specially adapted to arrest mixed germs is being prepared, and already we have flattering results.

[2] These points are also part of the paper I am preparing for the Chicago Medical Society.

[3] Serum produced by immunizing the horse with the complicating germs usually found in the lungs in pulmonary phthisis has proven very efficacious in mixed infections.

SOCIETY PROCEEDINGS.

Chicago Pathological Society.

Regular meeting November 9, 1896.

Dr. JAMES B. HERRICK, President, in the Chair.

Dr. ARTHUR DEAN BEVAN read a paper on

CAUSES OF OBSTRUCTION OF THE COMMON BILE DUCT.

The following is a synopsis: The subject of gall bladder and gall duct surgery is of recent development. In 1867 Bobbs of Indiana first performed cholecystotomy; in 1882 Langenbuch made the first cholecystectomy; in the same year Gaston suggested cholecystenterostomy and demonstrated its feasibility by experimental operations on dogs, and in 1889 Terrier performed the first anastomosis between the gall bladder and the small intestine. In 1890 Courvoisier added the last of our present list of operations on the bile tracts, choledochotomy. In the last six years the pathology and surgery of the gall tracts have been carefully studied and worked up, and we are now in a position to draw conclusions approximating the truth.

In the development of this work many men have taken part. Among those who have done much for this new field of surgery should be mentioned Lawson Tait, Courvoisier, Riedel, Czerny, Murphy, Fenger, Merrmann, Terrier, Heddaeus, Kehr, Sendler, McGraw and Mayo Robson. The work of these men has gained for the surgery of the bile tract a recognition among standard surgical procedures. As in any line of surgical work, this work rests upon a careful study of the anatomy, the physi-

ology and pathology of the structures involved, and of a careful analysis of the clinical histories of cases. It is not my intention to weary you with a review of the anatomy and physiology of the bile tracts, but I would desire to emphasize the fact that in no field of surgery is this elementary knowledge of more value to the diagnostician and the operator than here; a knowledge of the pathology of the conditions which demand surgical interference is no less necessary; this knowledge has grown with the development of the surgery of the bile tracts; a thorough knowledge of the anatomy, physiology and pathology is requisite, therefore, to the correct interpretation of the clinical evidences submitted by an individual case; the pathologic conditions which may interfere with the normal functions of the bile tract are many, and it is to this point, and especially to the causes of obstruction of the common duct, that I desire to call your attention in this paper, and it is in this line that I would ask that your discussion be directed.

To no one does the practical surgeon turn more frequently for instruction than to the pathologist; the findings of the postmortem room are the proofs of the correctness or error of his diagnosis and practical work. It is usually an easy matter to make the sweeping diagnosis of obstruction of the common duct. It is, however, often difficult or impossible antemortem to diagnose correctly its exact cause. For instance, in one list of reported operations for cases diagnosed as obstruction of the common duct, more than one-half were shown by laparotomy to be due to other conditions. My own limited work has curiously emphasized this point, and has led me to search rather carefully the literature with the hope that a careful study of the pathologic conditions found postmortem and by laparotomy, together with the clinical histories of the cases, might lead to a better understanding of the subject, to more accurate diagnoses and to fewer unnecessary operations.

As a basis upon which to discuss the broad question of the causes of obstruction of the common duct, let me report briefly some cases of common duct obstruction, each one illustrating a different type, which have come under my own observation. These cases show the difficulty of making an accurate diagnosis of the cause of the obstruction.

Case 1.—An Italian of 65, referred to me by Dr. Coolidge. Intense jaundice of six months' standing, frequent attacks of colic, intermittent chills and fever, pain over epigastric region; on pressure some sense of resistance, but no distinct tumor. Diagnosis: Probable obstruction of common duct by stone. Operation at Presbyterian Hospital, assisted by Dr. Coolidge. Found carcinoma of head of pancreas, atrophied gall bladder, no stone. Abdomen closed, patient recovered from operation; died some months later from carcinoma.

Case 2.—A woman of 35. Intense jaundice of four months' duration; previous history of frequent attacks of colic, no history of having passed stone. Intermittent rigors and fever. Enlarged and easily palpated gall bladder. Operation at St. Elizabeth's Hospital; abdominal incision, exposed gall bladder, distended, aspirated it; contents clear, glycerin-like fluid, about half a pint; as the last of this fluid was drawn out a sudden rush of pure bile came out of the needle with some small fragments looking like ground coffee; bile tracts examined, no stone found. Several very large lymphatic glands in front of common duct larger than the end of my thumb; these were tightly bound down between the folds of the gastro-hepatic omentum and produced direct pressure of common duct. Gall bladder was stitched to abdominal wound and drained; bile flowed very freely from fistula, jaundice disappeared, temperature became normal and patient improved greatly; later a cholecystenterostomy with Murphy's button was made by my colleague successfully. The pathology of this case is uncertain, but I introduce it here to show the possibility of obstruction of the common duct by pressure of enlarged lymphatic nodes in the gastro-hepatic omentum.

Case 3.—A case at St. Luke's Hospital in which I was associated with Dr. L. L. McArthur. A woman of 35; repeated attacks of jaundice, no clear history of colic, last attack of jaundice has persisted for three months, slight temperature, general condition fair; physical examination negative. Operation by Dr. McArthur revealed no stone, normal gall bladder; a firm smooth mass in head of pancreas, which we believed to be carcinoma, although it did not feel like one. Cholecystenterostomy with Murphy button, recovery and improvement, disappearance of jaundice, subsequent history makes diagnosis of carcinoma improbable. Dr. McArthur and I now both believe the case to be one of obstruction of the common duct by pancreatitis.

Case 4—A woman of 23, referred to me by Dr. Frankenthal; history of repeated attacks of colic and jaundice; intermittent temperature, pain over epigastrium. Diagnosis: Obstruction of common duct probably due to stone. Physical examination negative. Operation at St. Luke's Hospital. Gall bladder normal: in front of common duct an atheromatous cyst three and a half inches long and one inch in diameter, between the layers of the gastro-hepatic omentum and winding over the right edge of same into the foramen of Winslow. With great difficulty the cyst wall was dissected out entire; wound packed with gauze and tube. Recovery normal; left hospital at end of four weeks; jaundice and pain disappeared. This is a most interesting and rare case; I find the only one on record of an atheromatous cyst producing obstruction of the common duct, although Wiedel reports a case of an atheromatous cyst in the gall bladder. There is some question as to the pathology of the condition, for the section of the cyst wall shows no epithelium, but the gross appearance of the cyst and its contents were typical of atheromatous cyst, and a careful examination excludes echinococcus and does not furnish positive proof of tuberculosis.

Case 5 is a postmortem made at Leipsig by Birch Hirschfeld, which I had the opportunity to examine; the patient had died of cholemia. The examination revealed obstruction of common duct due to syphilitic gumma.

Case 6.—A man of 60; repeated attacks of jaundice and colic, remittent slight elevations of temperature, pain over epigastrium; referred to me by Dr. Herrick, who made the diagnosis of obstructive jaundice, probably stone. Operation at Presbyterian Hospital. Gall bladder very small; stone in common duct, freely movable; common duct incised, stone removed, no other stones found; could not close duct with suture, so drained with rubber tube and gauze; recovery uninterrupted; bile flowed through tube for nine days, then ceased and evidently now flows into duodenum. Jaundice has disappeared. Pain has ceased and patient has apparently made a complete recovery.

Here we have in these six cases six different and distinct pathologic conditions of obstruction of the common duct. In reviewing the literature I find many others. Grouped together I find that obstruction of the common duct may be due to:

1, catarrhal jaundice; 2, gallstones in common duct; 3, carcinoma of the duct; 4, stricture; 5, sclerotic pancreatitis; 6, gumma; 7, hydatids in duct; 8, ascaris, seven cases reported; 9, pressure from stone in cystic duct; 10, enlarged lymphatic glands by pressure; 11, pressure from extramural tumors: benignant; atheroma, papilloma, papillomyxoma; and malignant; sarcoma and carcinoma; 12, pressure from inflammatory exudates; 13, adhesions producing flexures of the duct; 14, tuberculosis, one case reported.

I have grouped together all the causes of obstruction of the common duct reported in the literature to which I have access. Many of these causes are extremely rare, but the very number of possible causes shows how difficult it is to make a positive diagnosis before operating. The common causes of course are catarrhal obstruction, stone and carcinoma. In many cases it is not difficult to distinguish between these conditions and yet it has been impossible to make an absolute diagnosis in the majority even of the cases submitted to operation, as shown by the cases collected by Greig Smith, in which thirty-five laparotomies for suspected stone showed in eighteen cases obstruction due to other causes.

DISCUSSION.

Dr. D. W. GRAHAM—There is one cause of obstruction of the common duct mentioned by Dr. Bevan which has lost much of its importance, as we shall see if we compare the literature of today with that of twenty or thirty years ago. I refer to gastro-duodenitis. While no doubt a few of the milder cases of jaundice are still properly attributable to this cause, gastric disturbance accompanied with jaundice even though mild and transient, which were formerly ascribed to gastro-duoden-

itis, are today properly counted as due to the passing of gall-stones through the common duct into the intestine.

Dr. HEKTOEN—Attention may be briefly directed to chronic biliary obstruction due to chronic cholangitis following acute cholangitis developing in close connection with typhoid fever. The gall bladder has been shown by Fütterer and Chiari to become a reservoir for typhoid bacilli in typhoid fever. The bacilli may remain in the bile long after subsidence of the fever. The routine bacteriologic examinations during postmortems made the last two years or so of typhoid fever patients have confirmed these statements. Cases of suppurative cholangitis and cholecystitis have also been described after typhoid fever. Not long ago I made a postmortem examination of a woman for Professor Henry M. Lyman. Some years previous to death she had an illness diagnosed by Professor Lyman as typhoid fever; toward the end of the attack there developed jaundice and pain in the region of the gall bladder. Since then she suffered from chronic jaundice, dying from hemorrhage from a gastric ulcer, after having presented for a time the bone symptoms of osteomalacia, which was verified by the autopsy. In this case there was a dense fibrous peri-cholangitis and -cystitis, the bile ducts being greatly narrowed and practically occluded. The liver contained biliary retention cysts and was quite green in color. General jaundice was present.

Dr. SAMUEL H. FRIEND read a paper on "Investigations upon an Umbilical Origin of Peritonitis."

Dr. LEMKE presented a paper for Dr. Dysart on

THE ACTION OF HUMAN SERUM UPON TYPHOID BACILLI; A CLINICAL STUDY.

Dr. Lewis R. Dysart, late resident physician of the Cook County Hospital, has made a clinical study of the action of human serum upon typhoid bacilli, the more important results of which I have the honor of communicating to the Society, in the absence of Dr. Dysart, who has gone to Mexico.

The majority of the tests were made by making an emulsion of typhoid bacilli in a drop of water upon a glass slide; three or four drops of blood were then obtained upon a glass slide, and by touching the blood with a loop of platinum wire the serum which collects on the outside of the drops was transferred to the emulsion of typhoid bacilli, with which it was thoroughly mixed. Care was taken that the bacilli were thoroughly emulsified, so that no clumps were present before the addition of the serum.

A cover glass was then placed over the emulsion and this examined with an oil immersion; hanging drops were also made in a like manner. Other tests were made according to the methods of Professor Pfeiffer, which consists in adding blood serum to an emulsion of typhoid bacilli in a test tube and noticing the formation of clumps, as seen by the microscope, and the precipitation of the bacteria to the bottom of the tube, as shown by the clearing up of the fluid and the appearance of a flocculent precipitate.

In eighty-nine cases of typhoid fever, where the clinical diagnosis seemed positive, and in some few of which the postmortem findings were those of typhoid, the bacilli rapidly gathered into the characteristic clumps; some of these were large and others of medium size, the bacilli becoming immotile. The clumping in many of the cases was marked as soon as the specimen could be gotten under the microscope, and in all at the end of from three to five minutes.

In fifty nine cases in which the clinical diagnosis was not typhoid fever, and in many instances verified by the postmortem, the reaction was not obtained. This list includes a great variety of different diseases, such as cirrhosis of the liver, chronic valvular heart disease, tertiary syphilis, pulmonary, intestinal and bone tuberculosis, malarial fever, lobar pneumonia, acute rheumatism, carcinoma of the stomach, tetanus, gonorrheal rheumatism, multiple neuritis, nephritis, hysteria, insanity, etc.

The reaction was obtained in three cases of diseases not typhoid fever; namely, in one case of acute articular rheumatism, in one of malaria (controlled by demonstration of the organisms in the blood) and in one of chronic rheumatism. In the last case only was there a history of typhoid fever previously, namely, thirty years ago. The reaction in these cases was prompt and the clumps were large. In two cases in which the diagnosis of typhoid fever seemed positive, clumping did not occur in five minutes, but when the Pfeiffer method was used marked clumping occurred within a short time, with considerable precipitation in the bottom of the tube. One of these patients has since died and the postmortem examination showed lobar pneumonia and the characteristic typhoid lesions.

In two cases in which the diagnosis of typhoid is not positive (patients still living) the reaction was not obtained by the simpler method but the Pfeiffer method gave a positive result. In one of these cases the diagnosis lies between an acute exacerbation of a chronic endocarditis and typhoid fever, in the second between typhoid and malaria, but the plasmodia were not found. In two other cases the reaction was also obtained but the diagnosis of typhoid did not seem absolutely positive but no other definite diagnosis could be made. In two cases in which the diagnosis lay between typhoid fever and miliary tuberculosis in one case and acute exacerbation of a chronic endocarditis in the other, the reactions were all negative. No opportunity has presented itself to verify the indications thus obtained by autopsies.

From a study of the cases, positive as well as negative, and also from a careful consideration of the doubtful cases referred to, Dr. Dysart reaches the following conclusions:

1. This reaction can be obtained from the great majority of, if not from all, patients suffering from typhoid fever.

2. That the reaction can not be obtained from the great majority of other diseases.

3. That in three cases, clearly not typhoid fever, a marked reaction was obtained repeatedly in the hanging drop.

4. That in some cases of typhoid fever, in which the reaction is not obtained within five minutes in the hanging drop preparation, the Pfeiffer test tube method may give positive results.

5. The absence of the reaction in typhoid fever has not yet been demonstrated to occur in cases verified by postmortem examination.

6. The presence of lobar pneumonia, and probably other complications and sequelæ of typhoid fever, does not prevent the occurrence of the reaction, as shown by two cases verified by postmortem examination.

7. In doubtful cases the serum should be diluted in accordance with the methods of Durham, Greenbaum and others, and in this manner the results might be found to be more definitely conclusive.

DISCUSSION.

Dr. PREBLE—I have followed Dr. Dysart's studies in the wards with a great deal of interest, because the subject is of far greater importance than the subjects which we ordinarily meet. Every one knows the extreme difficulty at times of making a positive diagnosis of typhoid fever. It is to be regretted that Dr. Dysart had so few opportunities to apply this test to cases in which the differential of typhoid fever from diagnosis of other diseases such as acute miliary tuberculosis is difficult. It is in these cases that we wish such aids as this. The method appeals to one as possibly being a rational one: I suppose the rationale of the test being, that the serum of typhoid patients contains antitoxins, which in some way impair the vitality of the typhoid bacilli, thus causing the motion to cease. It would be interesting to know in what way the serum of typhoid patients affects the bacterium coli commune, which resembles the typhoid bacillus in so many respects. Perhaps Dr. Lemke will be able to enlighten us upon this point. The

test has not been used to any great extent as yet. Dieulafoy reported one hundred cases of typhoid fever, each time with the same result, the serum causing agglutination of the typhoid bacilli. It is as important to know the negative side of a test as to know the positive side. We can know this only by further observation of cases of endocarditis, miliary tuberculosis, and cryptogenetic sepsis and the like, in which there is later opportunities of confirming the diagnosis by postmortem.

Dr. BABCOCK—I would like to ask at how early stages in typhoid fever the serum works on this culture.

Dr. WEAVER—There was a question raised in regard to the action of the serum in the case of the bacillus coli communis. It has been shown that the bacillus coli communis thrives in typhoid serum and that there is no clumping or death produced. This work which Dr. Dysart has done has added considerably to our knowledge of a subject which we know comparatively little about so far. The work of Dr. Dysart seems to me to be one of the most valuable things in a scientific line that has been carried out by any of the house men in the County Hospital, so far as I know anything of their work, for a number of years. It seems to me he deserves particular credit for this work which he has accomplished.

Dr. HEKTOEN—It will be remembered that when Pfeiffer and Kolle published their first article concerning the action of serum of immune animals on typhoid bacilli they asked particularly that the profession repeat these experiments and verify them, and it seems to me that in Dr. Dysart's work this request has been carried out well. The practical importance of this reaction, the apparent rationale of which we all understand, is being appreciated everywhere, and this is shown by the fact that already the boards of health have arranged for carrying out this reaction quite generally.

Dr. HERRICK—Dr. Hektoen has called attention to the fact that boards of health have already offered to make examinations in the same way that examinations are made for the profession in suspected diphtheria. That has been rendered possible by the fact that this same reaction has been found to occur when a drop of dried blood, even though it be several days old, is moistened with water and added to the emulsion of typhoid bacilli. The reaction with the dried blood has been proven by Widal, and independently, I believe, by Wyatt Johnston of Montreal, who, about a week ago, reported that fact and made the announcement that the Montreal Board of Health would make examinations for the profession.

Still, we must not be premature in our conclusions. If Dr. Dysart's results are true, it shows that perhaps 3 per cent. of failures will be met with. He found in three cases, one of acute articular rheumatism, one of chronic rheumatism and one of malaria, a distinct reaction, and found it repeatedly, so that the test may be, after all, rather of negative than of positive value, that is to say, the failure to get the reaction may be all that we can rely upon and it may tend to exclude typhoid fever.

Dr. HEKTOEN—That is a very proper objection taken by Dr. Herrick just now; it may be said, however, that the test as carried out by Dr. Dysart is not altogether correct, because the serum must be diluted to a certain percentage, and in his last conclusion Dr. Dysart referred to that fact and says, that in continuing such tests, if the serum be properly diluted according to the recommendation of certain authors, the reaction may become more conclusive; and herein lies opportunity for still more work in the future.

Dr. LEMKE—With reference to Dr. Babcock's question, I can only say that Dr. Dysart was able to get positive reaction in all cases entered at the hospital; in many cases it was at the end of the first week.

EXHIBITION OF SPECIMENS.

Dr. L. HEKTOEN showed a *carcinoma* of the *pylorus* with extensive growth of tumor into the veins about the stomach removed from a greatly emaciated colored man, 56 years of age, upon whom, as a last resort, an operation for gastro-enterostomy had been made by Prof. John B. Hamilton, shortly before death. The tumor is situated around the pylorus, which is practically occluded, and it presents a large ulcerated surface with raised margins. The particular feature to which attention is called is the extensive growth of tumor tissue into the wall of the stomach and behind it (Fig. 1). The gastric veins are all distended and nodular, as though they were the seat of an extensive thrombosis. This tumor-thrombosis, so-called, extends into the portal vein and fills the entire main trunk, and from this vein the thrombosis extends backward against the blood current into the veins that go to make up the portal vein, the splenic vein and the superior mesenteric vein for some distance, but just how far can not be said, because in the removal of the growth these veins were cut off while still containing tumor masses in the gastro duodenal vein. There is also extensive secondary carcinoma of the lymphatic glands in the gastrohepatic omentum and the pressure of these upon the bile ducts produced biliary obstruction and some jaundice, and this is still shown in the specimen by the greatly extended gall bladder.

In order to explain the intravenous extension of the tumor it is assumed that in some way the carcinoma grew into the venous or capillary network of the wall of the stomach and

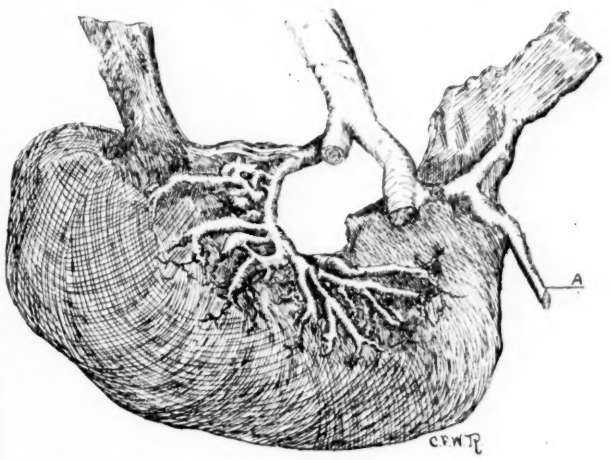

Fig. 1.—Growth of carcinoma into gastric and portal veins and the radicles of the latter, secondary to carcinoma of the pylorus. The posterior surface of the stomach, which is turned so that the pylorus is to the left, is exposed. A, cut end of gastro-duodenal vein, from which the microscopic section drawn in figure 2 was taken.

from there rapidly extended in many directions, finding but little obstruction to its growth in the blood channels. It is quite remarkable that the growth should continue against the current instead of into the liver, as would be expected. There were no metastases in the liver. Contrary to expectations there was no ascites. The absence of ascites is hard to explain. The extreme emaciation and the consequent small amount of blood in the body may have allowed collateral circulation to be established without any evident changes in the caliber of the collateral channels.

The microscopic examination (Fig. 2) shows the lumen of the gastro duodenal vein, at a point about three inches from its end, to be filled with a typical carcinomatous growth, the islands of epithelial cells being enclosed in distinct and often broad bands of connective tissue which seem to be more an integral part of the tumor than a new production from the vein wall. Here and there are spaces filled with blood, and it may be that the portal circulation was maintained in sufficient degree to obviate passive congestion through such spaces in the "carcinomatous thrombus."

Dr. KING presented some specimens of *tuberculosis testis* and related the history of the case from which they were obtained.

Dr. HERRICK presented specimens of heart, showing *mitral and tricuspid stenosis.*

He said: I will take a few minutes to show a heart that shows mitral and tricuspid stenosis, the third case that has come to the autopsy at the County Hospital recently. It concerns a middle-aged woman with a previous history of rheumatism, subjective symptoms of heart disease and physical findings that indicated pericarditis. Tricuspid stenosis was not recognized during life. The heart shows a mildly enlarged left ventricle, the walls thickened, the mitral valve with the cusps thickened and drawn together, the orifice admitting perhaps one and one-half finger tips; the left auricle is also enlarged, as it is in any case of mitral stenosis. In the left heart I should also say the aortic valves are slightly thickened and it was thought at the autopsy, which was made by Dr. Hektoen, there was possibly a slight incompetency. The

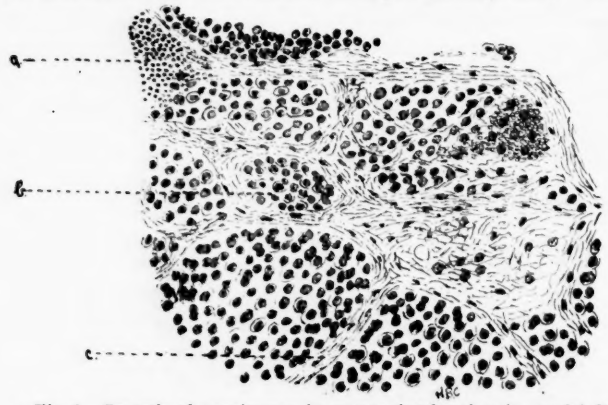

Fig. 2.—Growth of carcinoma in gastro-duodenal vein, multiplied 175 times; a, blood; b, cell nest; c, connective tissue trabeculæ.

right heart shows a dilated and hypertrophied right ventricle, the tricuspid orifice admitting three finger tips, the free margins of the valve being thickened and deformed. The right auricle is hypertrophied and dilated. At the last meeting I reported two cases of tricuspid stenosis and it is certainly very strange that a third case should have come to autopsy within so short a time. This case corresponds to the common findings in cases of tricuspid stenosis. The patient was a woman; the tricuspid obstruction is combined with lesions of the left heart and most commonly with an obstruction at the mitral valve. This is further a case of acquired tricuspid stenosis, not congenital, that being proved by the absence of symptoms of cyanosis in earlier life, proven also by the absenee of defects in the ventricular and auricular septum and of a history of rheumatism.

PRACTICAL NOTES.

More "Brutal Figures" in Favor of Serum Treatment of Diphtheria.—Cuno describes in the *Deutsche Med. Woch.* of December 24 the results of two years' treatment of diphtheria with Behring's serum at a hospital in Frankfurt a.-M. There were 483 cases received in all and the mortality fell from never less than 37 per cent. in previous years to 10.5 per cent. of the total number, or to 7.03 per cent. excluding the moribund cases. The noticeable feature of the report is that no local treatment was used. It was found that with sufficient doses of the No. 3 serum the false membranes rolled up at the edges, seemed to dry up and were finally expelled without bothering the already sufficiently tormented little patients with local applications. Heart weakness was combated with injections of alcohol and camphor, and abundant nourishment was given through a sound if necessary.

Erythromelalgia.— Dr. Schenk has described a case of erythromelalgia in an article published in the *Medicinische Presse*, on the subject of his clinical investigations of the nervous system. This disease was first described by Graves and afterward by S. Weir Mitchell, according to whom it is a disturbance of the circulatory system, whereas Vulpian named it *paralysie vasomotrice des membres.* At present it is supposed to be the result of a disturbance of the nervous system. The symptoms include sleeplessness, urinary and rectal troubles, spinal ataxy, atrophy of the skin and the muscles of the upper arms, increase of the knee-jerks, analgesia alternating with hyperalgesia, and decrease of the sexual impulse. The urinary and sexual disturbances are due to a lesion of the vesico-spinal and genito-spinal centers which are to be found in the region of the fourth lumbar vertebra; the ataxy points to a disease of the posterior column, the increase of the knee-jerks to an irritation which may be caused by an inflammation. The disease is no doubt due to vaso-motor disturbance consequent on an ascending degeneration in the posterior column of the cord. Woodnut has also described a case of erythromelalgia due to myelitis.—London *Lancet.*

The Treatment of Piles and Pruritis Ani with Collodion.—Dr. D. W. Samways says he has found that the itching in cases of pruritis ani disappears at once on the application of simple collodion. After a few moments of somewhat intense smarting (which can be prevented by cocain if necessary) no further itching is felt ordinarily for twelve or twenty-four hours, if at all. He supposes that the ether or alcohol in which the gun-cotton is dissolved stops the irritation and the collodion film, by protecting from the air, prevents its reappearance. In cases of external piles he has observed that the application stimulates the pile to contract, that the hardening film of collodion supports the pile thus contracted, and that the contracting collodion (not collodion flexile) further reduces it. It is the principle of the elastic stocking applied to the hemorrhoidal instead of the saphenous veins, he says, and with a like result. The collodion is best applied by dropping it on a few fibers of cotton wool, which are spread over the pile each morning after defecation.—*British Medical Journal*, November 21.

Effect of the Influenza Bacillus on the Central Nervous System.—Cantani first ascertained that rabbits supported easily intracerebral injections of sterilized water, and intraperitoneal injections of non-fatal doses of Fraenkel's diplococcus. He then experimented with living cultures of the influenza bacillus (Pfeiffer's), injecting them into the dura mater and even into the brain matter. The results showed that the brain is a particularly favorable medium for the development of the influenza bacillus. A series of passages through rabbits' brains produced a culture which killed others in small doses injected into the peritoneum. The same results were obtained by inoculating with cultures first sterilized by being heated to 55 degrees C., only larger quantities were required. The animals that died from the injection of the virulent cultures, showed all the signs of a profound infection. The congested peritoneum frequently contained extravasated fluids; the spleen, kidneys and capsules were gorged with blood; the bladder contained bloody urine. The lungs were congested, the pericardium contained exudations. But in none of these organs, nor in the blood, was the influenza bacillus discovered. The brain had every indication of a subacute meningo-encephalitis, and the bacilli were found in the cerebral and also in the medullary substance.—From the *Ztschr. f. Hyg. u. Infectionskr.*, No. 2.

Trional.—The superiority of this hypnotic over all others is proclaimed anew by Von Mering in the *Presse Médicale* of December 9. He has administered it to over a thousand patients without a single accident. His dose is 1 to 1.20 gram before retiring each night, and it can be kept up for a long while. It is especially serviceable in neurasthenic insomnia, psychosis with excitement, etc. In insomnia due to some painful affection he gives 5 milligrams of morphin with the gram of trional. Not content with his own experience, he wrote to

seventeen eminent authorities, including Krafft-Ebing, Norden, Jastrowitz, Binswanger, Rabour, etc., for their opinion of trional. Fifteen expressed their preference for trional; one used sulfonal or trional indifferently, and the seventeenth failed to reply. Dr. Vogt recommends that a certain quantity of some warm liquid be taken at the same time (about 200 grams). If the trional is continued a long while it is well to have a bottle of some alkalin water taken during the day (Vals, seltzer), and to suspend the medication for a day or so every five or six days. The one drawback to trional is the hemato-porphyrinuria occasionally caused by it to a slight extent ("infinitely less frequent than with sulfonal"). Von Mering's experiences and experiments incline him to believe that it is not due directly to the trional, but to a sort of idiosyncrasy, a less than normal resisting power to the effect of the medication. (See the JOURNAL, page 765, Vol. xxvii.)

Alexandroff's Sign for Early Diagnosis of Coxalgia.—Beside the usual symptoms of incipient coxalgia, Alexandroff insists on the importance of two additional signs, the atrophy and fatty degeneration of the muscles and bones, and especially the hypertrophy of the subcutaneous cellulo-adipose layer, which exists in every stage of the disease from the first and increases with the gravity of the case. In advanced stages the hypertrophy extends throughout the whole member. This is the cause of the effacement of the fold between the thigh and buttocks (*pli fessier*) and the difference in this respect between the sound and the affected thigh is very evident, as much as 1½ to 4 mm. in some cases. Alexandroff has invented a special instrument, the adipometer, resembling Weber's compass, to measure the thickness of this subcutaneous layer. The movable portion of the apparatus slides on a graduated plate and a spring near the handle allows a pressure of 5 to 10 grams. He has been using it for six years and states that atrophy of the member coinciding with hypertrophy of the fold, is one of the most important signs by which to recognize tuberculous osteo-arthritis before any other symptoms have appeared, while the absence of these trophic troubles is conclusive evidence of the non-existence of a tuberculous lesion of the coxo-femoral articulation, even when it is indicated by other symptoms.—*Presse Médicale*, December 9.

Surgery of the Pancreas.—A successful operation for tumor of the head of the pancreas which has showed no relapse in the two years since, inspired the surgeon D. Biondi, to study the literature on the subject and experiment for himself further. He found that his was the only successful case of the kind on record. He ascribes the infrequency of such operations to the difficulty of diagnosing, as neighboring organs may be the seat of trouble, and also to the difficulty of operating in such friable tissue and the dangers of hemorrhage. He states that it is necessary to leave a portion of the head of the organ, as total extirpation is fatal, while animals and his patient bore partial extirpation without inconvenience. His method was the extra-peritoneal treatment of the pedicle. His patient recovered rapidly and gained twenty-four pounds in six months. He finds that small wounds of the wall of the common bile duct heal without closing the lumen. Also that the secretions of the pancreas are liable to cause peritonitis indirectly, and therefore it must not be allowed to penetrate into the peritoneal cavity. It is impossible to prevent this if the entire head of the pancreas is removed, although as stated above, a portion of the head can be removed with impunity if one of the ducts is left intact. The indications for surgical intervention he considers to be cysts, hemorrhage, suppurations, local fatty degeneration, calculi and benign neoplasms. In malignant neoplasms an operation may ensure six to eight months of comparative health. He recommends an exploratory laparotomy to confirm the diagnosis (*Cbl. f. Chir.*, December 19). We note in connection with the difficulty of diagnosis in these cases a recent case described in the *Wien. klin. Woch.*, No. 45, which presented every symptom of intestinal occlusion, although no obstruction was found at the laparotomy to account for it. Death soon followed and the necropsy disclosed apoplexy of the pancreas with gangrene of the peritoneum and purulent peritonitis.

Ulcus Ventriculi Treated by Rectal Alimentation Alone.—Boas and others have recommended this method of treating ulcus ventriculi when all others have failed, but E. Ratjen writes to the *Deutsche Med. Woch.* of December 24 describing the brilliant results he has obtained with it, used exclusively. Treatment commenced at once as soon as the diagnosis is established. He combines it with the strictest repose in bed and absolutely nothing taken into the stomach except clear water, peppermint tea, or pieces of ice dipped in brandy and water if there is heart weakness. The absolute rest for the stomach thus induced (even the secretion of hydrochloric acid ceases comparatively) allows the healing process to continue undisturbed, and the relief from pains reconciles the patient to the treatment. He uses Boas' clysma (250 grams milk, two yolks of eggs, a pinch of salt, one tablespoon red wine, one tablespoon starch flour) three times a day for ten days, after a natural or artificial evacuation of the bowels each morning. A special apartment is set apart for the use of these patients in his hospital or at their homes, where they never see or smell the food of others. Local hot compresses are used to relieve pain. As aids to diagnosis he mentions the following symptoms: 1, the subjective symptoms make their appearance soon after eating and depend upon the variety of food; 2, the freedom from pain after vomiting and when the stomach is entirely empty; 3, the points painful to pressure in the epigastrium and in the back near the vertebra. The pains are worse during the ectasia of the organ from stenosis of the pylorus after eating and are relieved by acid vomiting; 4, the hemorrhages. The diagnosis can never be absolutely certain at the best, but this exclusive rectal alimentation benefits other gastric troubles and also serves to differentiate ulcus from carcinoma ventriculi. It has also been successful in one case of nervous vomiting from hyperesthesia of the stomach. He has found in each case that the stomach was not entirely normal in its position, and has explained to the patients the importance of having all their clothing suspended from the shoulder, etc. With three exceptions who did not complete the cure, the patients have all been able to eat solid food since without pain, and have increased in weight. His report includes fifty-five cases.

Hay Fever and Uric Acid.—Dr. N. L. Wilson of Elizabeth, New Jersey, writes the *New York Medical Journal* for December 26, as follows: "I do not mean to say that every case of uric acid diathesis is a hay fever subject, any more than I would say every such case had eczema, but I do mean to say that there is a close relationship between uric acid and hay fever, and I do say that every patient having a neurasthenic tendency, if you please, and a pathologic mucous membrane of the respiratory tract, is irritated by uric acid, and thus far my observations have led me to suspect it in every case of periodic hyperesthetic rhinitis. In the treatment of these cases the greatest care must be exercised. You must ever keep in mind that alkalies, salicylates, etc., produce a uric acidemia so long as there is an increase of uric acid within the system. During the attack they must be used with care and in small doses. I have certainly increased the severity of an attack by giving ten grains of salicylate of sodium three times a day. During the attack it is better to free the blood from uric acid by the administration of an acid. Aromatic sulphuric acid acts very well. After freeing the blood gradually extract the uric acid from the tissues by 2 or 3 grain doses of salicylate of sodium (given three times a day), cut off the acid-producing foods, such as meat, beer, wine, cider, lemonade, etc. Keep your patient's

nervous system in the best possible condition by proper feeding, hygienic measures, and nerve tonics if necessary. See that no polypi, spurs, or hypertrophies exist in the nostrils. Begin a crusade against uric acid six weeks or even two months before the time of the attack. For the local relief I have found menthol and camphor in liquid albolene, very gently sprayed into the nostrils, effectual in some cases. There are cases, however, which are apparently irritated by this solution, and for these I have found, if I would contract the tissue with a 6 or 10 per cent. solution of cocain, and then gently coat the turbinate with a thin film of flexible collodion, they would experience relief. For the itching and irritation of the conjunctiva, hot water or yellow ointment rubbed into the conjunctiva will afford relief.

Disinfection of the Urethra by the Internal Administration of Enterol.—Enterol is a watery, colorless, sometimes slightly brown liquid, with a specific gravity of 1,036, and with the taste and smell of kresol. It is slightly soluble in one hundred parts of water, and has about six times the antiseptic strength of carbolic acid. Properly diluted—that is, one part of enterol to five hundred of water, it can be given in the dose of from half a dram to a dram daily for months at a time without producing any untoward symptoms. It is given in pill, capsule, and mixture with equal parts of olive oil. Fass, in *Centralblatt f. die Krankheit. der Harn*, etc., states that thirty of the capsules can be taken at a dose without harm. After entering the stomach about 80 per cent. remains in the alimentary canal and 20 per cent. is excreted by means of the urine. If employed in weak dilution and with abundance of liquid, the probability is that much more is absorbed. In the treatment of bacterial inflammations of the genito-urinary tract, the patient is gently purged, the lower gut washed out with clysters of water or neutral oil, and a milk or liquid diet given, enterol being administered with each repast. After large doses and prolonged use of enterol the urine sometimes turns green. The author states, however, that he has given the drug in doses of one-half to one dram daily for weeks, the urine exhibiting the characteristic gray-green color, without producing any systemic complications. Indeed, the drug does not produce the slightest irritation in the kidneys or genito-urinary tract, and even in chronic nephritis the albumin contained in the urine is not increased. Nevertheless, we are cautioned against the use of the drug in cases of acute nephritis, congestion of the kidney, or feebleness of the heart. The drug possesses the merit of being safer and more efficient than any of the non-internal antiseptics. Nervous women, after taking the capsules, complain of an unpleasant taste in the mouth and burning in the stomach. When there is marked inflammation of the stomach the drug should be greatly diluted. In the case of gastric ulcer the drug should not be exhibited. The indications for the use of the drug are for the cure of cystitis, pyelitis, and before and after operative interference with the urinary passages in cases of acute gonorrhea. In the latter affection the enterol is particularly efficacious, eight capsules being given each day.

Guaiacol and Creosote in Pulmonary Phthisis.—Dr. F. R. Walters joins with some other contributors to the *Lancet* in drawing attention to the value of this group of remedies in the treatment of phthisis, which many in England are disposed to doubt. He says: I am well acquainted with the advantageous properties of the carbonates of creosote and guaiacol and have myself prescribed the former with apparent benefit. But at present the price of the drugs is prohibitive except for wealthy patients. A lady under my care who had been taking creosotal for a few weeks plaintively asked me one day whether it was absolutely necessary to continue paying a guinea a bottle for her medicine. In some recent wholesale price lists the carbonates are listed at prices from fifty cents to a dollar, or more, per ounce. These high prices are prohibitory for hospital patients, and are strongly objected to by ordinary middle-class patients when the course of treatment is (as it must be in phthisis) a long one. Under these circumstances one is driven to use the cheaper remedies in most cases and to overcome their drawbacks in other ways. The causticity of creosote and guaiacol has in my opinion been somewhat overrated, as I find them clinically well borne if suitably prescribed, in most cases in doses up to 45 minims per diem by the mouth, and occasionally in much larger doses. Every medical man is in the habit of prescribing without any ill effects such caustic drugs as phenol, liquor potassæ, and nitric and sulphuric acids, merely by suitably diluting them, and the same can be done with creosote and guaiacol. The latter should always be given on a full stomach, and their solution in alcohol or glycerin further diluted by mixing with some bland fluid such as milk. Possibly in this way an albuminate is formed; but at all events this is effective and in most patients causes no disturbance. Pills and capsules I regard with suspicion, as they might liberate their undiluted contents on the surface of the stomach and are much less readily tolerated by most patients. As regards the relative toxicity of creosote and guaiacol and their carbonates, one would not expect to find much difference after absorption, since the carbonic acid is liberated in the bowel. Poggi's experiments refer to guaiacol and not its carbonate. I hope very shortly to test their correctness. It will be a boon to the public if the profession can induce the manufacturers of creosotal to dispose of it at considerably reduced prices, and thereby themselves obtain for it a much larger market.—London *Lancet*, December 12.

Cause and Prevention of Suppuration of Stitches.—Some recent writers explain the occasional suppurations of the stitches in carefully performed operations to the presence normally of certain pathogenic microörganisms in the underlying layers of the derma which causes suppuration when exposed to the air by the wound. Remlinger even asserts that most of the microorganisms found in the blood drawn from the finger are derived from the lower layers of the skin. His statements are revolutionary in regard to the conclusions we have been drawing from inspection of a single drop of blood in infective disease. We know that the flora of the superficial layers is extensive, but he announces that he found the staphylococcus albus (twenty-three times); aureus (eleven times), and citreus (fourteen times); the streptococcus pyogenes (eight times) and the coli bacillus (five times), in his experiments on fifty perfectly healthy men, taken with a sterilized needle from the deeper layers of the derma. The only means to avoid error in examining the blood is to draw it from the deeper tissues with a needle not only sterilized, but inserted while still red hot. The logical inference is that surgeons should make their incisions with the thermocautery in order to destroy these intracutaneous germs, but the same effect is secured by a much simpler method, the disinfection of each stitch with alcohol, as E. Blondel announces in the *Journal de Méd. de Paris* in an able review of the subject and the latest theories. He has revived the Hippocratic practice of bathing wounds with wine as taught by Theodoric and Mondeville, and applies it with invariable success. Especially in total perineorraphy, which is so difficult to perform with perfect antisepsis, he has secured results far surpassing any previous achievements. He makes as few stitches as possible in the lower layers, and before drawing them tight he wets them and the edges of the wound with 90 per cent. alcohol, and sponges the tissues with a cotton pad dipped in it. Each suture is treated in the same way, and the final suture is sponged with strong alcohol and then dusted with iodoform or equal parts of dermatol and aristol, repeated every second day afterward. Alcohol dries the surfaces better than any other substance. Its effect on grease is also a factor in the result. It has a coagulating effect on the serum and thus favors cicatrization.

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SATURDAY, JANUARY 30, 1897.

THE HYPOTHETICAL CASE IN MEDICAL EXPERT TESTIMONY.

The value of the hypothetical case in obtaining medical expert opinion is one of the questions in regard to which both lawyers and doctors appear to disagree. A recent editorial in one of our contemporaries quotes a prominent lawyer as saying that it serves a purpose in showing the utter worthlessness of the opposing testimony, presumably seeing in it no other use or value. It was admitted by him that in this it was a weapon that cuts both ways and he considered that its influence in one direction was counteracted by that in the other, so that its real effect is practically zero.

If this notion is correct, no self-respecting expert would really care to go on the stand and answer a hypothetical question, and it would seem that no sensible lawyer would see any necessity for asking one, if the opinion obtained could be really at once counteracted by another equally well based. In fact, the lawyer's statement seems a little odd, since it practically assumes that the testimony on both sides must be equally worthless, and leaves a chance for anyone to suppose that he considers all testimony of witnesses as to facts, as well as of experts altogether, without value.

Theoretically, it would seem to an average, fair-minded individual that the hypothetical case offers an ideal method of obtaining expert opinion. A carefully drawn up question, embodying all the essential particulars fairly stated, is certainly a rational means of obtaining the correct judgment as to the assumed facts, and it has the advantage to the expert of saving him the trouble of delving into details and of making him more or less a witness as to facts instead of opinion. The possibility that the hypothetical case does not represent the facts, does not alter the case; the fault is then with the advocate, not with the expert. If it is so used it ought to be a dangerous weapon to its employer, provided the opposing counsel knows how to avail himself of his opportunities, and ought to indicate a recognized weakness of his case by him who employs it.

The hypothetical case has also the advantage that it is not so liable to make the expert an advocate, as is so often the tendency when one is testifying as to the result of opinions obtained by personal examination. Physicians on the stand, of course, need not be unduly interested on the side of their employers, and as experts should not be, but they have the common human weaknesses, and it is believed that perfectly honest men feel some sense of obligation to render a *quid pro quo* when they have received large fees, and this, in itself honorable, feeling may lead them into awkward situations on the witness stand. If they only expect to receive large fees for their testimony they are liable like other men to be led into temptation, which is the stronger if they have given time and trouble to the personal examinations than if they have merely read over and formed an opinion on a stated case. It is only by assuming that physicians do sometimes, probably unconsciously, yield to such temptations that we can account for some medical testimony. Of course one who can not free himself from all prejudices, that of interest as well as others, is not fitted to give an expert opinion, but all persons are not always aware of their disqualifications. While physicians are condemned for this occasionally, it is only fair to say that they are no more liable to be faulty in this regard than are judges or jurymen, who should of all men be the most impartial.

One great trouble with the hypothetical case is that there are so many lawyers who do not know how to properly construct it. In cases involving medical questions, such as insanity, etc., they should as a rule employ a competent expert to help them draw it up from the facts that are to be brought out by their witnesses. It need not include all the facts but only enough, simply and clearly stated, to enable their experts to express a positive opinion, as it will be a great advantage to their cause if still others are in reserve to be presented before the jury to strengthen the case after the opinions have been obtained. The value of such a method has been repeatedly demonstrated, notably in one rather recent case in one of the large cities where this policy actually made the experts for the prosecution the most effective witnesses before the jury for the defence.

There will be, without question, many physicians who will prefer in certain cases, to testify only after personal examination and study, but for general purposes and purely for the obtaining of expert opinion, it is probable nothing better than the hypothetical case has been or can be devised. An honestly drawn up hypothetical case can not hurt a good cause and may damage seriously a bad one; one that misrepresents the facts should not deceive a jury, with a competent opposing counsel, and in either case the position of the impartial expert is the same; he has only to give his opinion on the case as put before him.

SINUS-PLEURITIS.

That attacks of pleurisy often pass unnoticed during life appears perfectly evident from the frequency with which adhesions and other signs of that condition are found postmortem in cases in which death has resulted from some independent disorder. There also come under clinical observation a very considerable number of cases in which fever of varying type, intensity and duration is the most conspicuous manifestation and for which no adequate primary cause can be discovered. That in many of these cases the febrile manifestations are dependent upon some obscure inflammatory disorder there can be no reasonable doubt and it can scarcely be considered hypercritical to question the actual existence of such a state as simple continued fever. It is possible that local elevation of temperature may result from purely local influences, but the cause for general elevation of temperature must be sought in some disturbance of the thermotaxic mechanism, resulting in a derangement of the adjustment between heat-production and heat-dissipation. This disturbing influence may be chemic (nutritive, toxic) or physical (traumatic, inflammatory).

For a number of cases in which inflammation of the pleura pursues an insidious and latent course, as well as for another number in which apparently inexplicable fever exists, an explanation is offered by the account given by KOLL (*Deutsches Archiv für klinische Medicin*, B. lvii, H. 5, 6, p. 597) of a group of upward of 30 cases observed in the medical clinic of the Julius Hospital at Würzburg and which he characterizes by the designation sinus-pleuritis. The symptoms of the affection are suggestive of some disorder of the heart or stomach, so that its true nature may escape detection unless it be specially looked for. The lesion of the disease consists in an inflammation of the lowermost portion of the pleura anteriorly and laterally and sometimes posteriorly, unattended with demonstrable effusion. In the large majority of cases the disease sets in suddenly, like an infectious disease, with usually slight fever and other symptoms of constitutional disturbance, generally without appreciable cause. Only in a small number was a previous history of exposure to cold or of excessive physical effort, and the like, ascertainable. In isolated cases a relation appeared to exist between the attack and acute and muscular rheumatism. The disorder did not follow other affections predisposing to inflammatory complications of the serous membranes (diabetes, nephritis). In individual cases the onset was not acute, so that definite information as to the beginning of the attack could not be obtained. In one case it was related that the patient had had a similar attack some five years before.

The subjective manifestations in most cases pointed to acute or chronic gastric disease, the most conspicuous symptom consisting in diffuse or circumscribed tenderness in the gastric region, setting in suddenly during a state of health. A point directly below the apex of the ensiform cartilage was noted as painful with especial frequency. In about half the cases the pain was induced, or when already present, was increased by the ingestion of food, and almost always by pressure. Some patients further volunteered the information that forced inspiration was particularly painful. In a considerable proportion of the cases there was also frequent eructation and vomiting. One patient, in fact the first in whom the disease was recognized, presented symptoms of gastric ulceration, and she was accordingly nourished with food administered through a tube for a period of four or five days. In most cases the gastric symptoms disappeared in the course of several days almost completely. Almost all of the patients complained of pain behind and on either side of the sternum, radiating thence in the course of the inferior margin of the lungs. These pains, which were of burning character, were usually increased by deep inspiration, physical effort and inclination of the body forward. Some patients complained of palpitation of the heart and in some the frequency of the pulse was found to be increased (to 140) without, however, physical evidence of cardiac disease. One patient suffered for eight or ten days from severe dysphagia.

In most cases the constitutional symptoms were mild—headache, fatigue, general malaise, impairment of appetite. In several the attack set in with a chill. Usually there was slight continued fever (101.5 degrees). As a rule the temperature declined on the second or third day. Then there was slight irregular elevation of temperature, usually in the evening, in some cases continuing for weeks and months.

In all cases there was found constantly a soft, fine, rhythmic friction-sound corresponding and restricted in distribution to the pleural sinus in the region of the heart and along the lower lateral borders of the lungs. It was most marked at the left border of the sternum on a level with the fourth and fifth ribs and was noted with especial constancy somewhat within and generally below the apex-beat of the heart at the

level of the small bridge formed by the tongue-shaped process of the upper lobe of the left lung between the pericardiaco-costal sinus and the phrenico-costal sinus. This sound could be heard faintly at midsternum at a point corresponding to the slight marginal sinus of the right lung, and from midsternum at the level of the sixth rib it radiated with increasing intensity along the lower sinus upon the right and left sides almost to the vertebral column; or it ended gradually in the lateral portions of the reserve spaces. The sound was principally to be heard only during the second half, viz., at the height of a deep inspiration and at the beginning of expiration and disappeared usually after protracted vigorous breathing, to return in the course of two or three hours. In a few cases the sound could be heard during the respiratory pause, isochronous with or following the action of the heart. The pleural character of this "precordial" sound was established by the fact that it was heard only over the pericardiaco-costal sinus and never over any portion of the anterior surface of the pericardium not covered by pleura. That it is not physiologic and dependent upon the movement on one another of healthy pleural surfaces was shown by comparative observation. In patients in whom spontaneous pain or pain induced by pressure below the apex of the ensiform cartilage was present, a distant friction-sound was audible. This might have been due to inflammation of the diaphragmatic pleura or of adjacent peritoneum.

Of complications there was noted in two patients, in conjunction with acute exacerbations, acute intestinal catarrh. In a case consequent upon acute rheumatism mitral endocarditis was observed. Another case also presented acute endocarditis.

The disorder was characterized by its obstinacy of course and its tendency to relapse. Even in cases in which the objective manifestations were mild from the outset the friction-sound was most persistent. In general, aggravation and improvement alternated, little influenced by medication. The most marked of the subjective disturbances subsided after eight or ten days' rest in bed, while the objective phenomena underwent but little change. Salicylates, phenacetin and the like appeared to exert no influence. Calomel in doses of 2½ grains three times a day seemed to do good in some cases, as did also hot poultices.

In only about a quarter of the cases was recovery complete on dismissal from the hospital. The remainder, while in general free from subjective discomfort, except perhaps pain on deep inspiration or a sense of pressure or burning in the affected region, still presented objective manifestations. When the attack proper was over the patients displayed a tendency to lack for a long time the feeling of perfect health.

The condition is to be differentiated from acute or chronic gastric catarrh, gastric ulceration, pericardial disorders, intercostal neuralgia and, in the absence of fever, from simulation.

THE CONTAGIOUSNESS OF PNEUMONIA.

In the London *Lancet* (An epidemic of pneumonia occurring at Peshowar, *Lancet*, 1896, p. 1630), Dr. JOHN STEPHENSON of H. M. Indian Medical Service, reports an epidemic form of lobar pneumonia occurring in the men of the First Bengal Infantry. The epidemic lasted for two months in the coldest part of the year, and was most intense at the middle of this period, while it was more fatal in the the earlier part.

After giving details as to age, death rate, etc., the writer continues: "With regard to the etiology of the disease there were appearances at one time of its spread by contagion. Thus, the suddenness and severeness of the epidemic, and especially the so frequent development of the disease a few days after admission, led us to consider whether infection might not not be a factor of the etiology. It appeared almost as if the hospital wards themselves might be harboring and diffusing the causal microörganism. Many men were taken from the lines to act as sick attendants, and several of these men were taken into hospital suffering in the same way. Thus, a Christian bandsman was being nursed by another Christian, who contracted pneumonia and was also given a Christian attendant; the latter also became ill with pneumonia. This appeared to be a passing on of the infection from the first to the second and from the second to the third. However, on examining the statistics it was found that in reality the sick-attendants were no more frequently afflicted than the regiment generally."

Many years ago this question of contagion had attracted attention, for in the memoirs of the United States Sanitary Commission, Dr. RUSSELL reports: "The surgeons on duty with the regiments in the barracks (at Benton, Mo.) report that men occupying the same bunks with those affected were very much more liable to be attacked than those more remote. Some of the most intelligent surgeons believed that it was actually contagious."

Quite recently, Dr. J. B. AYER has alluded to this phase in a paper on "Senile Pneumonia" (*Boston M. and S. J.*, 1896, p. 305). In referring to the contagiousness of the disease in old persons he says: "I have in mind the cases of a matron aged 79 and a nurse of 45, both nursing a woman 57 years of age, who died on the fourth day following an attack of pneumonia. The matron died four days later with typical senile pneumonia; the nurse also died of pneumonia, surviving the patient eleven days. I can not recall another case where the disease was so plainly transmitted." Dr. W. H. THAYER, in a letter (*Boston M. and S. J.*, 1896, p. 379) commenting on Dr. AYER'S paper, throws some light on the subject by his statement that: "The increase of pneumonia has been in

the last thirty years, or since diphtheria became established in this country. Before the advent of diphtheria in 1858 contagious pneumonia was unknown, and single, uncomplicated pneumonia was rarely fatal. It was not recognized as a constitutional disease, but only as a local inflammation produced by exposure to cold."

More than twenty years ago Dr. WM. P. SEYMOUR of Troy, N. Y., began to recognize a pneumonia of diphtheritic character without any membranous exudation in the throat—he verified his observations by occasional cases from year to year—in which there was evident contagion, the fauces presenting a stringy secretion but no membrane.

It would seem that we have cases in which the diphtheria bacillus produces a typical lobar pneumonia, without involving the throat. If such be the case we can understand the so-called contagiousness. Probably researches to determine this point could be undertaken very profitably.

"CANCER HOUSES" AND CANCER AREAS.

Among other interesting topics connected with the alleged contagion of cancer is the one of "cancer houses" and cancer areas. By the former is meant houses which in a series of years will have several deaths from cancer among their tenants. The term cancer areas refers to large tracts of country where this disease is more than usually prevalent. The Old World offers a better field for observing these phenomena, as might be expected from the less migratory nature of its population.

Mr. LAW WEBB, known for his investigations into the immunity of colliers from cancer, has brought forward some interesting data on the subject of cancer houses (*Birmingham Medical Review*, 1892, p. 342). He states that in a certain village of Shropshire, of twenty houses, occupying not over an acre of ground, nine cases of cancer were treated in fifteen years. None of the patients were blood relations, but all the inhabitants used water from a pump by the roadside. One of the cottages which furnished three of the cases was preëminent for filth. Near this hamlet are three more houses which have furnished six cases of cancer in the last quarter century. Dr. ACKERLY relates an equally remarkable series at Ashburton, Devonshire. The town has a small stream running through it; near this stream (twenty yards), is a large house, with the cellars below its level, and where four cases have occurred in fourteen years: *A*, a lady occupying the house for many years; *B*, the next occupant, a lady; *C*, husband of *B*; *D*, the second wife of *C*. Again, four deaths have been reported in the last four years in persons living within 100 yards of the same house.

Mr. D'ARCY POWER narrates some striking examples in his paper on "Cancer Houses" (*British Medical Journal*, 1894, i, 1240). Miss B., aged 45, lived in a certain house in the suburbs of London for thirteen years, and died of cancer of the stomach in 1884. Miss T., aged 47, succeeded to her place and occupied her bedroom. She had lived in the house for twenty years, and died of cancer of the liver in 1885. Mrs. J., aged 67, who had lived in the house for twenty-eight years, succeeded to the place and to the bedroom occupied successively by Misses B. and T., died of cancer of the breast and uterus in 1893. Each of these patients appeared to be in perfect health until they took one another's place; there was no blood relationship. BLYTH mentions three successive tenants of a house, who died of cancer. The last one was visited by a Mrs. V., who subsequently was affected. Mrs. V.'s niece of 14 years, who nursed her and slept with her, contracted cancer of the breast. SCOTT (*British Medical Journal*, 1894, i, 1302) reports three cases in a damp house, and CHAPMAN (loc. cit.) three in a fine house standing in large grounds.

Nor are cancer houses confined to Great Britain, for at the Surgical Congress at Lyons in 1894, GUELLIOT mentioned fifteen examples which yielded fifty victims. FABRE, in his work "De la Contagion du Cancer" reports a case of MOLIERE'S. In a well built house at Lyons on the banks of the Saone four deaths from cancer occurred in a decade; there were no deaths from any other cause.

In regard to cancer areas it is well known that the frequency of cancer varies widely in different countries, and that in each country there are equally wide variations in the frequency of its occurrence in different districts. ARNAUDET claimed some years ago that cancer is much more frequent in certain districts of Normandy than in Paris. A committee of thirty-five physicians was formed in Normandy to investigate these figures of ARNAUDET, and they assert that while cancer is undoubtedly unduly prevalent in certain remote hamlets (due in their opinion to heredity), yet taking the whole of Normandy, it is no more frequent than elsewhere in France.

Mr. HAVILAND (Allbutt's System of Medicine, i, 52), who is distinguished for his researches into the medical geography of Great Britain, has shown that in England and Wales the areas where the highest mortality from cancer obtains are found to be about the lower parts of rivers flowing through low lying valleys, and which seasonally overflow their banks. The areas with the lowest mortality occupy the more elevated regions in the old rock formations, as the Cambrian, Silurian and mountain limestone; the last has the lowest mortality.

These facts by no means prove that cancer is contagious; they seem to afford some comfort, however, to the adherents of its parasitic origin. If the disease be due to an organism, there may be some com-

mon condition of soil and water in the cases quoted by which the organism is enabled to pass part of its life outside its host.

SANITARY TRIVIALITIES.

"And it shall be unlawful for any person or persons to use or to engage in the sale of any bottle, mechanism or other device for the artificial feeding or nursing of infants or children under three years of age, that has connected therewith a rubber tube, hose or such contrivance."

The passage of an ordinance in the above terms, by the Board of Aldermen of the city of Buffalo, signalizes another victory for the Commissioner of Health, Dr. ERNEST WENDE, over popular incredulity and ridicule. One astute city father declared that "this is drawing it pretty fine. There are many healthy specimens of manhood here today that sucked at the end of the long tube, and it is used for the young of animals, too," and it was gravely argued that being good for the raising of pigs it ought to serve equally well for babies. Another asked: "Can't you blow in the thing and clean it?" "The trouble with the Doctor," said a third lawmaker, "is he thinks he has a patent on the health of the city. His circulars are not panaceas." Nevertheless, the Health Commissioner showed that the circular which he had first issued on this subject, and which was antagonized by the very aldermen opposing the ordinance, had resulted in the falling off in deaths of infants from between four and five hundred to about two hundred and forty. After a last shot in the sneering question: "Why don't you go further and declare in favor of a certain kind of nipple?" the amendment was adopted and druggists can no longer sell nursing bottles with rubber tubes in the city of Buffalo.

The city fathers do not suck milk through a rubber tube, whatever else they may absorb by suction through straws or paper tubes and probably very few are interested in drug stores that sell them, but the city father does cough and expectorate and chew tobacco and spit, and so the anti-spitting ordinance has not yet been added to the municipal code, and perhaps it had better not be, if like the analogous regulation of the New York City Board of Health it is only to be printed in scarcely legible type and displayed where it can not be read, or if read is never enforced.

Buffalo has already accomplished a great deal in municipal sanitation. The regulation of the milk supply and the identification and isolation of diseased cattle in herds are all-sufficient. A register is kept in the health office of the location of every fatal case of diphtheria, scarlet fever and typhoid fever, and if these are found to occur along any special milk delivery route, all the milk supplied on that route is carefully traced to the dairy and thence to the herd.

Municipalities are only the aggregate expression of individual education and individual perceptions. Nine out of ten in the community doubtless thought with the Board of Aldermen that the commissioner of health was engaged in a petty business interdicting the rubber tube of the nursing bottle, and many of them will probably send elsewhere for them and surreptitiously use them in defiance of the ordinance. Let any one attempt to call attention in a New York street car to a violation of the spitting regulation and he will be insulted by the offender, told by the conductor that it is none of his business, and recognize unmistakable disfavor among the passengers. The well-meant suggestion to a mother that her daughter was incurring danger by holding an especially dirty bank-note between her lips while looking for change was rewarded by an angry scowl from both. There has lately been a favorite toy on sale in the large cities by licensed street vendors, consisting of a pair of painted rubber mustachios, inflated to the length of several inches by blowing through a tube held in the mouth, a huge papier maché nose adding to the attractive grotesqueness of the thing, for children. The vendors, who are of the lowest order of unclean Greeks, Armenians and Russian Jews, attract crowds by suddenly distending the mustachios, holding the tubes in their mouths until a purchaser is found, and respectable, well dressed, intelligent people may be seen handing the toy over to their little children. How many housekeepers ever give a thought to the refrigerator in the butcher's shop, loaded day after day with often questionable meat, to the fish-box in which layer after layer of stale fish is buried in the ice, to the musty receptacle in which the grocer stores his goods, or to the cellar in which the dealer in fruit and vegetables keeps his perishable stock? Does any inspector examine the storage boxes beneath the dining-car, when they are refilled at a station, to see that they are thoroughly emptied and cleansed before refilled? One is confronted everywhere by apparently trivial sanitary neglects, each of which in its possibilities for evil will be found anything but trifling. Dr. WENDE deserves to be congratulated on his success in suppressing the rubber tube of the nursing bottle, and the city of Buffalo for having a commissioner of health who is not deterred by ridicule from attacking so-called sanitary trivialities.

CORRESPONDENCE.

Section Dinners.

PHILADELPHIA, Jan. 25, 1897.

To the Editor:—Some of us who are most familiar with the Annual Dinners of the Section on Ophthalmology, hope that the setting aside of the first evening of the coming meeting of the AMERICAN MEDICAL ASSOCIATION for section dinners is a step in the development of what will be in future, a very important feature of our annual gatherings.

These originated in the Section on Ophthalmology from a

suggestion by Dr. Leartus Connor, in his address as Chairman of the Section at the meeting in Washington in 1891. The suggestion meeting the approval of the Section, the first dinner was arranged for the Detroit meeting in 1892, and since then it has been a most enjoyable feature of our annual meeting.

For the sound development of the ASSOCIATION it is of the highest importance that the members of each Section have opportunities for becoming personally acquainted with one another. Personal acquaintance and friendship constitute the strongest basis for organization and add immensely to the pleasure of the meeting; and to the certainty that year after year the members who have experienced such pleasure will be found in regular attendance. I believe that it is to this, more than to any other one thing, that the exceptional and steady growth of the Section on Ophthalmology of late years has been due.

In arranging for such a dinner, certain points seem to be well settled by the experience of those Sections that have adopted the custom. Some of these I would commend to the attention of Section officers:

1. The greatest economy of time is secured by having the Section dinner about the usual dinner hour, say, between 6 and 8 o'clock P.M.

2. The price fixed should be low, that it may not prove exclusive or burdensome to the younger and poorer members. The price fixed for the Ophthalmic Section is $2. This is quite sufficient to get a good dinner in any city that we meet in, but excludes wines, so that no difficulty is had from the scruples of the temperance members. At the same time those who wish wine are free to order for themselves.

3. No large number is necessary to make the dinner a success. Such an occasion may be quite as enjoyable where a dozen members with similar tastes and interests meet after the separation of a year as any larger gathering can be.

4. Speeches, if formal speeches are to be indulged in, should be *very* short. No one who can not recognize this requirement of the situation should be asked to speak. Indeed, it seems to me that a transgression against the rights of hearers, in the way of a tedious after-dinner speech, should be met by a polite, if possible, but firm refusal to listen, which might be expressed by the resumption of general conversation or by calling for someone else to speak. This sounds desperate, but desperate diseases demand desperate remedies.

To arrange for a Section dinner, the President of the Section, or, if the Section has an incompetent President who will not attend to the duties of his office, the Executive Committee should enter into correspondence with the proprietors of one of the hotels that are willing to grant concessions to the members of the ASSOCIATION. Or, what is perhaps better, the Section officer should enlist the service of some active and competent member of the Section residing at place of meeting. Having fixed the price to be paid per plate, the hotel manager can be asked to furnish a bill of fare, such as he would be willing to supply at such a price. When the arrangement has been made, and it should be made early, it should be announced through the JOURNAL and upon the program of the meeting, if this is sent to members of the Section. The announcement should state time, place and price of the dinner, and the name and address of the member to whom the names of those expecting to attend should be sent two or three days before the meeting.

If the President of each Section will this year take fifteen minutes and write to the proper member of his Section, resident in Philadelphia, a letter urging him to move promptly in the matter, and stating what is desired as to price and the probable number to be provided for, every Section can at the coming meeting have a successful dinner, to which those who participate will in future years look back with pleasure.

Some of the Section officers have, I know, already taken the necessary steps, and it is to be hoped that the others will immediately follow their example.

EDWARD JACKSON, M.D.

PUBLIC HEALTH.

The New Fluid Vaccin.—The New York City Board of Heal has recently undertaken the preparation of bovine vaccin capillary tubes and in vials, at a cost of 10 cents for a cap lary tube suitable for a single case, vials for ten vaccinatio and for fifty, at 75 cents and $3, respectively. The ivory poin are sold as formerly at 10 cents each. The pulp virus is exa ined bacteriologically and clinically before it is allowed to used or sold. The tubes and vials should be kept in a co dark place and should not be opened till the time of using t virus. The virus is usually reliable for twelve weeks from da of collection, which is marked on containing box, but shou not be used for a longer period than three days from the da of opening the vial. The virus may be removed from the vi by dipping into it the accompanying slip of wood, and fro the capillary tube by blowing it out with a rubber bulb. T virus should be smeared on the scarified area and thoroughl rubbed in. Merely smearing it in is not sufficient. The ar should be left bare until the virus has entirely dried.

Over 5,000 Cattle Condemned for Tuberculosis.—The Cattle Co missioners of Massachusetts have made their annual report f the year 1896. A large showing of work is made as to t quarantining of animals regarded as infectious and suspicio the examination of animals coming from without the State the cattle markets without certificates, and upon special pe mits, examination of stables with a view to their sanita improvement, and laboratory and stable experiments to det mine various problems connected with the work of the boa A table is given showing the number of animals quarantin in each city and town, the number condemned and the amou paid. There are 550 animals which have been condemned, b the warrants for killing are in process of settlement. T totals of this table are: Meat cattle assessed in the tow 212,601; number tested 8,969; number condemned 4,6 amount awarded $153,733. Thirteen towns made no returns to herd inspections. During the year the board has had at disposal $30,000. It has paid for 5,198 head of cattle co demned as tuberculous, the sum of $173,206. There are hand 550 warrants for cattle to be killed, the value amountin to $16,040. There has been paid for quarantine expense $2 223, making a total of $217,470 returned to cattle owners.

The Great Convention of the "Antis"—There is proposed to held a great convention of the anti-vaccinators and other en mies of disease prevention, at or near Gloucester, England, the year 1898. It is expected that Bacillus will preside, b there will be even older and better known names among th guests of honor. An English writer suggests that some go aristocratic names might be had to lead off with as, for exa ple: "The Duke of Anasarca, Marquis Sarcoma, Earl Röthel Viscount Rubeola, Lord Pertussis. Legal luminaries, wh have just as much to do with the subject, could be represent by Lord Justice Chlorids and Sir Albuminoid Ammonia, Q. The names of microbes might be borrowed and slightly mo fied to give dignity to the list: Sir Staphylococcus Aure (suggestive of an eminent financier), the Rev. Bacillus Pe digiosus, D.D., Dean of Albumoses, etc. The names wou sound well to foreign ears and really it seems a pity that should have to put up with second-rate titled people when have got such a good choice and such a wide range of profe sions to select from, whose members have just as much to with public health work."

Leprosy in Iceland.—Dr. Edward Ehlers of Copenhagen, is the author of a prize essay on that subject. It is especially devoted to the study of the conditions under which leprosy has declined in Iceland and the extent of its former and present prevalence. Dr. Ehlers from his researches believes that leprosy was introduced into Iceland, after the crusades, from Norway. In the seventeenth century the disease was very prevalent, little being done in the way of isolation or otherwise to limit its spread. A great epidemic of smallpox in 1707, and of measles in 1846, did more than all other measures to lessen the number of lepers, as they were the first to succumb to any epidemic influence. At the present time it is computed that there are about 200 lepers in Iceland. As there is a considerable number of Icelanders in Manitoba, it is important that a strict watch should be kept on all emigrants coming from Iceland. The London *Lancet* has the following item which places the number of cases much higher than has been reported by Ehlers:

"Iceland, although larger than Ireland, is so sparsely inhabited that altogether the population does not exceed 75,000 or about one person to the square mile. Amongst the number, however, there are no fewer than 400 lepers, and yet no attempt has so far been made either to alleviate the condition of the sufferers or to prevent the spread of the disease. There is not a single refuge or hospital for lepers in the whole island. In the other parts of Europe where the disease is prevalent, to wit, Spain, Portugal, Italy, Turkey, and the Scandinavian peninsula, lazar-houses were long since established, to the great advantage of the healthy as well as of the afflicted. In Norway especially, where of recent years segregation has been rigidly enforced, a great improvement has taken place and, according to M. Hallopeau, there are not now more than 800 lepers in a population numbering upward of 1,700,000 souls. Iceland, of course, belongs to Denmark, but its shores are largely frequented by the French for fishing purposes, while many English tourists visit the island every summer for sport or relaxation. It is certainly little creditable to international hygiene that no steps have been taken to ameliorate the miserable condition of Icelandic lepers."

Deficient Supplies of Water for the Cities of Eastern New York.—An interesting report relating to the water supply of New York and Brooklyn and the Hudson valley cities has been made by Dr. Smelzer, the Secretary of the New York State Board of Health. It is held by him, and others whom he has conferred with, that this whole question should come under State control and in no way better than in connection with the work of the State board of health. For the past ten years the State of Massachusetts had maintained as a part of its State Board of Health an engineering department at an expenditure of $30,000 a year, and, to use the language of that board: "It is difficult to estimate the extent of the useful results accomplished under the provision of the act establishing it." All sections of the country were indebted to Massachusetts for researches in connection with the purifying of water supplies. A comprehensive system of water supply, which should apply to the Greater New York and most of the Hudson valley cities, ought to be investigated and worked out by State authority, as was so satisfactorily accomplished for Boston and suburbs by the State of Massachusetts. An abundant supply of water could be obtained from the southern and eastern slopes of the Adirondacks for New York and Brooklyn, as well as for the Hudson valley cities. This was an enterprise, the report said, vitally affecting the health of a large population and it would more properly come within the scope of the State Board than under any other department. As an illustration of the very good work that could be done in that way the Croton watershed investigation was referred to, which the State Board of Health made in 1886. It was very much to be desired that an appropriation be secured to inaugurate and carry on this important work.

Egypt's Need for a Quarantine against the Plague.—Circumstances alter cases. The recent history of Bombay in respect of the plague is exciting solicitude in Egypt, for that country was once its habitat. It is true that there has been no plague there since 1845, but if it were to be accidentally re introduced it might be even more difficult than was the case with cholera to eradicate it from its former haunts. No one knows quite why plague suddenly left Egypt, for it can hardly have been due entirely to the sanitary precautions of that day. Perhaps it was merely an extension of the eastward recession of the disease, which began in the latter half of the seventeenth century and helped, with other causes, to free Europe from its ravages. Quarantine may be quite unnecessary in England, protected by its insular position and by the millions spent upon the country's sanitation, but one can not help feeling that Egypt is still somewhat like a powder magazine from which the tiniest spark has very jealously to be excluded. The quarantine regulations of 1878 against plague have just been revised by the International Board in Alexandria. In accordance with modern notions ships are divided into three classes—clean, suspected, and infected. In the case of clean ships coming from a plague striken port seven days must have elapsed, linen and bedding must be disinfected, and drinking-water must be renewed. Suspected ships are defined as those on which there has been plague, but not for the last nine days. Ships carrying a medical officer and a disinfecting stove will be allowed to traverse the Suez Canal in strict quarantine, while other ships will be kept long enough to disinfect clothes and personal effects and to satisfy the sanitary officer that there are no fresh cases on board. Passengers destined for Egypt will be kept under observation for two days while their effects are disinfected. Lastly, there are the infected ships, meaning those which have had a case of plague on board during the last nine days. Passengers suffering from plague must be isolated in a hospital on shore. Healthy passengers are to be divided into small groups and kept in quarantine long enough to allow eleven days to have elapsed since contact with the last case. The whole ship and its contents are to be disinfected, and as in all other cases, the drinking water is to be renewed and the bilge water disinfected and discharged.—London *Lancet*, January 9.

Action Regarding the Prevention of Tuberculosis.—Important action was taken by the Health Department of New York city on January 19, including pulmonary tuberculosis among the communicable diseases that must be reported by physicians to the sanitary bureau. The sanitary code was amended by the adoption of a new section, as follows: "Pulmonary tuberculosis is hereby declared to be an infectious and communicable disease, dangerous to the public health. It shall be the duty of every physician in this city to report to the sanitary bureau in writing the name, age, sex, occupation and address of every person having such disease who has been attended or who has come under the observation of such physician for the first time within one week of such time. It shall also be the duty of the commissioners or managers, or the principal, superintendent or physician of each and every public or private institution or dispensary in this city to report to the sanitary bureau in writing, or to cause such report to be made by some proper and competent person, the name, age, sex, occupation and last address of every person afflicted with this disease who is in their care or who has come under their observation within one week of such time. It shall be the duty of every person sick with this disease and of every person in attendance upon any one sick with this disease, and of the authorities of public and private institutions or dispensaries to observe and enforce all the sanitary rules and regulations of the Board of Health for preventing the spread of pulmonary tuberculosis." The medical members of that department, Commissioner George B. Fowler, M.D., and Drs. Hermann M. Biggs and T. Mitchell Prudden of the pathologic service have made a very close study of the prevalence of tuberculosis and of the best measures applicable

to a large city for its prevention. An estimate has been made that 20,000 sick exist in that city, and that the ravages by tuberculosis have increased 30 per cent. in the last fifteen years. A recent report by these gentlemen contains four leading recommendations that can be acted upon at the present time: "1, that such action be taken by the health board as seems necessary and proper to at once secure the provision of hospital accommodations, under its charge, for the care of the poor suffering from pulmonary tuberculosis, who, as active sources of danger to the community, may properly come under its supervision; 2, that an amendment be made to the sanitary code declaring that tuberculosis be officially considered a communicable disease, and formulating regulations under which its sanitary surveillance shall be exercised; 3, that all institutions in this city which admit and treat pulmonary tuberculosis be subjected to regular and systematic inspection by officials of this board, and that specific regulations be established for the conduct of such institutions in accord with the proposed amendment to the sanitary code; 4, that the scope of the measures designed for the education of the people in regard to the nature of pulmonary tuberculosis and the methods to be taken for its prevention be enlarged, and a closer sanitary supervision be maintained over individuals suffering from this disease in the densely populated tenement districts and in the crowded workshops and public buildings of the city." Their report also states further their convictions that the action proposed is timely and feasible: "We fully believe that with proper regulations tuberculosis may be restricted within the the narrowest bounds and eventually, perhaps, almost exterminated. This is not the idle dream of sanitary enthusiasts or theorists, but is a conviction founded upon the most thorough and conclusive experimental investigations, which have been amply confirmed by practical experience." In order to make possible such restriction in the prevalence of this disease, it is necessary that the health department shall assume a more complete and comprehensive control. This requires: 1, the adoption of such measures as shall make possible the general sanitary supervision of pulmonary tuberculosis under well defined conditions and regulations, differing in many respects from those applied to other more readily communicable diseases; 2, the possession of such facilities for the care of the poor suffering from it as shall make possible the removal, when necessary, of those who are dangerous sources of infection. "From the beginning of this work the officials of this department have encountered, in the utter lack of proper facilities for the care of consumptives, an obstacle to practical success so great and so disheartening that we feel impelled to urge our conviction that the grave responsibility which rests upon the health department in this matter can not longer be adequately sustained without the immediate establishment under its direct control of a hospital for the sole benefit of the tuberculous sick."

NECROLOGY.

EDWARD PEARSON ELLIOT, M.D., first assistant in the Danvers Insane Hospital, died January 10. He was a native of Boston and was a graduate from Harvard College in 1875, and from the Harvard Medical School in 1882. He served as house-officer in the City Hospital two years, and studied abroad two years. He had held his position in Danvers during the past twelve years.

ASA J. WHITE, M.D. (University of Buffalo, 1863), of Cortland, N. Y., died from apoplexy, January 12. He was assistant surgeon of the 109th Regiment, N. Y. Vol. Infantry from Sept. 4, 1864 to June 4, 1865.

LUIGI CALORI, professor of anatomy at the University of Bologna, Italy, for fifty-three years, and subsequently president. So many prominent members of the profession have died abroad within the past few months in the early prime of life, that we note with satisfaction that the career of this popular writer and instructor was rounded out to a more natural completion; he was in his 90th year.

JOSEPH A. LIVINGSTON, M.D., of Brooklyn died Dec. 31, 1896, in his 28th year, by typhoid fever, with intestinal perforation. He was a native of that city and a graduate at the Long Island College Hospital, of the class of 1890. He was for a time in practice at West Cornwall, Conn.

BYRON W. MUNSON, M.D., of Sharon, Conn., died January 3 of asthma and heart trouble. He was 53 years old. Dr. Munson was a graduate of the Yale Medical School of the class of 1869. He served through the late war with the medical corps. From 1881 until 1890 Dr. Munson was superintendent of the State Soldier's Home at Noroton, Conn.

ANDREW J. FULLER, M.D., one of the best-known physicians of Bath, Me., and the first vice-president of the AMERICAN MEDICAL ASSOCIATION, died there, January 10, aged 74 years. Among the offices he had held was that of president of the Bath Board of Trade for eighteen years, and of the Lincoln fire insurance company for five years. He was graduated in medicine from the Bowdoin School of Medicine in 1841, and Jefferson Medical College in the year following. In 1871, he was president of his State Medical Society. During the war he was surgeon to the Second Maine Infantry. He was connected in a prominent way with life insurance interests. His first place of settlement was Searsmont, but in a 1847 he became permanently domiciled at Bath. An essay by him on the treatment of cholera infantum was presented as a report to our ASSOCIATION in 1856.

LOUIS J. SASS, M.D., of New York City, November 19, at the age of 76 years. He was a native of Havana, and was graduated from the New York Medical College in 1858. He was one of the pioneers in the modern treatment of diseases of the nose and throat, a specialty in which he won considerable distinction. He had a great deal of mechanical ingenuity, and was perhaps, the first to make use of compressed air for the application of medicated sprays to the larynx and nasal passages.

DANIEL MARCH, Jr., M.D., of Winchester, Mass., died in Woburn, January 1, aged 52 years, of angina pectoris. Dr. March was born in New Haven, Conn., but came to Woburn with his parents when a boy. He graduated from the medical school of the University of Pennsylvania in 1868. After serving as house physician of the Episcopal Hospital in Philadelphia for over a year, he removed to Pittsburg, where he practiced for a time. He removed to Winchester in 1879, and had a large practice in that town and vicinity. He joined the Massachusetts State Medical Society and his professional life is the subject of the following note in the *Boston Journal*: "He succeeded Dr. Winsor of Winchester, as medical examiner of the fourth Middlesex District about ten years ago and held that office ever since. He fell over a wire fence a few days ago while crossing a lot and received a severe shock, from which he had suffered considerably, and he had thought of going away for a while to recuperate."

MISCELLANY.

Notice to Physicians and Librarians of Public Medical Libraries.

[Medical journals are requested to copy this notice.]

1. Correspondence in relation to the enterprise should be addressed to Dr. Geo. M. Gould, 119 S. 17th St., Philadelphia.

2. Librarians of public medical libraries are requested to notice these exchange lists and to correspond direct with the advertised donors and recipients; and are also urged to for-

ard to Dr. Gould: 1. Accurate lists of periodicals, books or amphlets needed to complete their files. 2. Lists of duplicates which they will give other libraries or exchange for umbers desired. *Give both volume numbers and dates of eriodicals.*

3. Every physician is to inspect these lists and to give the ooks and periodicals for which he has no further use to public libraries, and having no particular choice, to correspond ith Dr. Gould in reference to their disposal, in order to secure he greatest usefulness by the profession.

4. Owing to the additional labor it would involve, queries oncerning the supply of desired items to private libraries can ot be answered.

5. The conditions of all gifts are that the recipients shall be eputable organizations, composed of the regular medical profession; that the library shall be a public one—*i. e.*, open for consultation during stated times to physicians generally; and that, if unbound, the periodicals and books received shall be ound and catalogued.

6. Send nothing before corresponding, in order that the ifts may go direct from the donors to their proper destination.

7. In order to secure the best success, physicians and librarians of other countries are invited to coöperate.

8. Notify Dr. Gould of any gifts or exchanges effected.

Previous list: November 21, 1896.

DUPLICATES FOR DONATION OR EXCHANGE.

THE PUBLIC LIBRARY, DETROIT, MICH., HAS:

Albany Medical Annals, vol. 9, 1888, Feb'y, April, May, Oct.

Am. Journal of Ophthalmology, St. Louis, vol. 2, 1885, Jan., April, Aug. Sept.

Am. Journal of Obstetrics, vols. 15, 1882; 16, 1883; 19, 1886, unbound. Vol. 15 lacks Jan.

Am. Journal of Ophthalmology, vol. 1, 1884, Jan., April, June, July.

Am. Journal of the Medical Sciences, vol. 103, 1892, Jan.

Am. Lancet, vols. 13, 14, 17, 18; 1889, '90, '93, '94.

Am. Medico-Surgical Bulletin, vol. 6, 1893, Feb'y and Dec. lacking; vol. 8, 1895, October lacking.

Berliner Klinische Wochenschrift, vol. 24, 1887, Nos. 40, 41, 43-47, 49, 50, 51.

Boston Medical and Surgical Journal, vol. 104, 1881, Nos. 1-4, 6-25; vol. 116, 1887, Nos. 1-4, 6-8, 10-26; vol. 120, 1889, Nos. 1-10, 12-17, 19-26; vol. 121, 1889, Nos. 1-3, 5-13, 15-26; vol. 122, 1890, Nos. 1-14, 16, 20, 21.

Canadian Practitioner, vol. 10, 1885, Nov. number lacking.

Chicago Medical Journal and Examiner, vol. 41, 1880, Jan., Feb., May, June; vol. 47, 1883, Feb.

Cincinnati Lancet-Clinic, vol. 7, new series, 1881, Jan., No. 1; vol. 9, 1882, Nos. 24, 25; vol. 13, 1884, Nos. 2-13, 15-19, 22, 23, 26; vol. 14, 1885, No. 19; vol. 18, 1887, No. 19, 3 copies.

Detroit Medical Journal, vol. 1. 1877, Jan.–Oct., Dec.

Epitome, A Monthly Retrospect, vols. 8, 10, 1887, 1889.

Epitome, quarterly edition, vol. 5, 1884.

Epitome of Medicine, vol. 8, 1891; vol. 9, 1892, Oct. and Dec. lacking.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, vol. 1, 1883, Nos. 1-8, 10-12, 14-26; vol. 2, 1884, Nos. 1-8, 11-26; vol. 6, 1886, Nos. 1-5, 7, 9-20, 22-26.

Kansas City Medical Index, vol. 10, 1889, Feb'y, Dec.

London Lancet, 1887, Jan.–Nov.

Louisville Medical News, vol. 8, 1879, Jan., 4 copies.

Medical Brief, vol. 16, 1888, Jan.–Aug., Dec.

Medical News, vol. 61, 1892, Nos. 1-25.

Medical News and Library, vol. 34, 1876, Jan.–May, July–Dec.; vol. 35, 1877, Jan.–March, May–Dec.

Medical News and World, vols. 7, 9, 10, 1889, '91, '92.

Physician and Surgeon, vol. 12, June, Sept.–Dec.; vols. 13, 14, 17, 1891, '92, '95.

Quarterly Journal of Psychological Medicine, vol. 4, 1870, April and July; vol. 6, 1872, Jan.–July.

Southern California Practitioner, vol. 6, 1891, March–Nov.

Toledo Medical and Surgical Jour., vol. 3, 1879; vol. 4, 1880.

THE CLEVELAND MEDICAL LIBRARY ASSOCIATION, CLEVELAND, OHIO, HAS:

Wood's Library: Keyes, Venereal Diseases, 1880. Phillips, Chas. D. F., Materia Medica and Therapeutics, 1879. Salter, H. H., Asthma, its Pathology and Treatment, 1882. Noyes, Hy. D., A Treatise on Diseases of the Eye, 1882. Milton, J. L., Pathology and Treatment of Gonorrhea, 1884. Sternberg, Geo. M., Malaria and Malarial Diseases, 1884. Maclagan, T. J., Nature, Pathology and Treatment of Rheumatism, 1886. Eichhorst, Herman, Diseases of Nerves, Muscles and Skin, 1886. Longstreth, Morris, Rheumatism, Gout and Some Allied Disorders, 1882. Routh, C. H. F., Infant Feeding and its Influence on Life, etc., 1879. Pavy, F. W., A Treatise on Food and Dietetics, 1881. Parkes, E. A., Manual of Practical Hygiene, 2 vols., 1882. Smith, Eustace, On the Wasting Diseases of Infants and Children, 1885. Amory, Robert, A Treatise on Electrolysis, 1886. Index to Wood's Library, 1879-84. Dujardin, Beaumetz, Diseases of the Stomach and Intestines, 1886. See, Germain, Diseases of the Lungs, 1885. Powell, R. Douglas, Diseases of the Lungs and Pleura, 1886. Phillips, C. D. F., Materia Medica and Therapeutics, 1882. James, Prosser, Therapeutics of the Respiratory Passages, 1884. Eichhorst, Herman, Diseases of the Circulatory and Respiratory Apparatus, 1886; Diseases of the Digestive, Urinary and Sexual Apparatus, 1886; The Blood, Nutrition and Infectious Diseases, 1886. Buck, Albert H., Diagnosis and Treatment of Ear Diseases, 1880. Piffard, Henry G., Materia Medica and Therapeutics of the Skin, 1881. Wilson, James C., The Continued Fevers, 1881. Wendt, Edmund C., Asiatic Cholera, 1881. Witthaus, Robt., General Medical Chemistry, 1881. Rosenthal, M., Diseases of the Nervous System, 1882. Ellis, Edward, Diseases of Children, 1879. Guttmann, Paul, Handbook of Physical Diagnosis, 1880. Putzel, L. Functional Nervous Diseases, 1880. Paul, Constantin, Diseases of the Heart, 1884. Verrier, E., Practical Manual of Obstetrics, 1884. Griesinger, W., Mental Pathology and Therapeutics, 1882. Sajous' Annual for 1891, 5 vol. Eberle, John., Practice, vol. i, 1830. Cooper, Samuel, A Dictionary of Practical Surgery, vol. i, 1830 (sheep). Transactions of the Ohio State Medical Society, 8th meeting, 1853 (unbound). Transactions of the New York Academy of Medicine, vol. ix, 1893; 2d series, vol. vi, 1890 (unbound). Transactions of the Ninth International Medical Congress, 5 vol. (unbound). Braithwaite's Retrospect. Nos. 1, January to July, 1840 (unbound); 4, July to January, 1841; 7, January to July, 1843 (bound); 8, July to December, 1843; 10, July to January, 1844 (bound); 10, July to January, 1844 (unbound); 13, January to July, 1846 (bound); 15, January to July, 1847 (bound); 17, January to July, 1848 (bound); 19, January to July, 1849 (bound). Parts 25, 1852 (unbound); 31, 1855 (unbound); 31, 1855 (bound); 33 and 34, 1856 and 1857; 35, 1857; 36, 1858; 37 and 38, 1858 and 1859; 39, 1859; 40, 1860; 41, 1860 (bound); 42, 1861 (bound); 43 and 44, 1861; 45 and 46, 1862 (bound); 65, January to June, 1877 (unbound).

Medical News and Abstract, vol. 39, 1881; also for 1880.

Americal Journal of Obstetrics, vol. 18, 1885.

Prager Vierteljahreschrift für Praktische Heilkunde, Jahrgang 27, 1870; Jahrgang 26, 1869.

Bronson's Medical History and Biography, 1876, 3 duplicates (bound).

Boston Medical and Surgical Journal, vols. 97, 1877 (bound); 98 and 99, 1878; 100, 1879 (bound); 101, 1879 (bound); 103, 1880; 105, 1881; 106, 1882; 107, 1882.

London Lancet, 1880, 1881, 1882, 1883, 1879; vol. 1, 1845.

British and Foreign Medico-Chirurgical Review, vols. 1, 1848; 2, 1848; 3, January to April, 1849; 4, July to October, 1849; 5, 1850; 6, 1850; 7, 1851; 8, 1851.

W. U. REBER, M.D., LEHIGHTON, PA., WILL DONATE:

American Journal of Medical Sciences, 1866 to 1882, complete; 1866 and first half of 1867 bound in three volumes.

American Journal of Obstetrics, all of 1882, including quarterly supplements; also the supplement of October, 1881.

Obstetrical Journal of Great Britain and Ireland, American supplement, all of 1874.

Quarterly Compendium of Medical Science, 1883, Jan., April, July; 1884, Jan., April, July, Oct.; 1885, Jan. only; 4 series, April, July, Oct.; 5 series, April, July, Oct.

Medical Abstract of Medical Science, vols, 2-7 (1875-1880).

Half Yearly Abstract of Medical Science, 1867 to 1871, in full; 1873 in full; 1874, Jan. only.

London Lancet, vols. 1 and 2 of 1893.

Annals of Surgery, vols. 15 to 18, 1892, 1893; extra numbers, 6, of vol. 15, and 5, of vol. 20.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, vols. 25 and 26, 1895; vol. 27 up to No. 20, 1896.

Medical News, vols. 27 to 29, 1869 to 1871, March No. of vol. 27 missing; vols. 31-37, 1873-1879; vols. 38-39, 1880-1881; also the supplement of July, Aug., Sept., Oct. and Nov. of 1874.

Half Yearly Compendium of Medical Science, 1874, part 14, July only; 1875-1882, parts 15-30, complete.

University Medical Magazine, vol. 1, complete; vol. 2, Nos. 1-10, only; vols. 6 and 7, 1894-5, complete; also extra No. 1 of vol. 1.

Annals of Hygiene, vol. 2, Nos. 6-12, 1887, an extra copy No. 7; vol. 3, Nos. 1-4 and 6-11, 1888.

New York Medical Record, vol. 20, Nos. 14-27, 1881; vols. 21 and 22, 1882, complete; vol. 34, Nos. 12-16, 18 and 19, 1888; vol. 46, 1894, complete; vols. 47 and 48, 1895, complete; vol. 49, 1896.

New York Medical Journal, vols. 21 and 22, 1875, complete; vol. 42, 1885, Nos. 5-13 only.

Medical and Surgical Reporter, vols. 32–43, 1875–1880, complete; vols. 44 and 45, 1881, No. 23 of vol. 45 missing; vols. 46–49, 1882 and 1883, complete; vol. 50, 1884, No. 19 missing; vol. 51, 1884, No. 24 missing; vols. 52 to 59, 1885–1888, complete; also odd numbers, Jan. and Dec., 1894, Oct., 1888, and July, 1887.

Ephemeris of Materia Medica, Pharmacy, Therapeutics, etc., vol. 1, No. 1 missing; vol. 2.

American Journal of Pharmacy, vol. 3, 1873, Nos. 4–12; vol. 46, 1874, complete.

Therapeutic Gazette, 3d series, vol. 1, 1885, complete; vol. 2, 1886, Nos. 1–8 only; vol. 4, 1888, No. 3 only.

Philadelphia Medical Times, vol. 18, new series, vol. 1, Oct., 1887 only; vol. 19, new series, vol. 2, Oct., 1888 only.

International Journal of Surgery, vols. 6–8, 1893–1895.

Railway Surgeon, vols. 1 and 2, 1895 and 1896.

New Remedies, vols. 6–9, 1877–1880; vol. xi, 1882.

Homeopathic Recorder, vol. 1, 1886, Nos. 4, 5 and 6; vol. 2, 1887, complete; vol. 3, 1888, Nos. 1, 2, 3 and 6.

North American Journal of Homeopathy, vols. 13 and 14, 1865 and 1866, bound; vol. 1, No. 2, Nov., 1886, unbound.

The Bucknell University Library, Lewisburg, Pa., has:

Braithwaite's Retrospect, vols. 57, 58, 59 and 60.

Obstetrical Journal, supplements, vols. 1, 2, 3, 4, 5 and 6.

FOR SALE.

The following volumes may be had at exceptionally low rates. Prices made upon application. These sets were bought remarkably cheap and will be sold at cost, but only to public medical libraries. Private buyers need not apply.

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Johnson's Medico-Chirurgical Review, Vols. 1 to 42, including the years 1820–1843 in the old series and a continuation of six volumes in the new series, 1843–47. Cloth.

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THE BUCKNELL UNIVERSITY LIBRARY, LEWISBURG, PA., NEEDS:

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London Lancet, all before 1866, and 1879 and 1880, and all after 1881.

Medical and Surgical Reporter, vols. 1–4, inclusive; 6–13, inclusive; and all after vol. 27.

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needs numbers to complete volumes as follows:

American Journal of Insanity, vol. 35, July and Oct., 1879; vol. 36, Oct., 1879 and Jan., 1880; vol. 41, Jan. and April, 1885; vol. 46, Oct. 1889, Jan. and April, 1890; vol. 47, July and Oct., 1890; vol. 49, July and Oct., 1892.

American Journal of Ophthalmology, vol. 1, 1884, Oct. and Dec.

American Journal of the Medical Sciences, vol. 5, n. s., April, 1843; vol. 11, n. s., April, 1846.

AMERICAN MEDICAL ASSOCIATION, JOURNAL OF, vol. 22, 1894, Nos. 15 and 17–26.

American Practitioner, vol. 4, 1872, March; vol. 8, 1873, June; vol. 20, 1879, April and May; vol. 25, 1882, March.

American Practitioner and News, vol. 10, 1890, March; vol. 16, 1893, July; vol. 17, 1894, July and Dec.

Annals of Surgery, St. Louis, vol. 4, 1886, April.

Archives of Dermatology, vol. 3, 1877, Oct.

Archives of Gynecology, Obstetrics and Pediatrics, 1891, May; 1893, Nov. and Dec.

Archives of Pediatrics, vol. 10, 1893, Feb. and July.

Atlanta Medical and Surgical Journal, new series, vol. 3, Feb., 1887; vol. 7, Sept., 1890; vol. 9, Sept., 1892, Jan. and Feb. 1893; vol. 10, Jan. and Feb., 1894; vol. 11, Feb., 1895.

Berliner Klinische Wochenschrift, 1881, Nos. 6, 7, 20, 22, 27, 52; 1882, Nos. 17, 47, 48, 52; 1883, Nos. 4, 15, 22, 51; 1887, Nos. 10, 12, 22, 24, 30; 1889, Nos. 2, 43, 50, 51.

Boston Medical and Surgical Journal, vol. 123, 1890, Nos. 1, 2, 4, 7, 8, 10–14, 21.

British Medical Journal, 1878, March 16, May, 4, August 3; 1887, August 27, Oct. 15, Nos. 5, 12, 19, Dec. 17; 1893, Oct. 28, Dec. 30.

Brooklyn Medical Journal, vol. 3, 1889, Jan. and Feb.

Buffalo Medical and Surgical Journal, vol. 19, 1879, Nov.; vol. 20, 1881, April.

Canada Lancet, vol. 13, 1880, Nov.; vol. 14, March, June, August, 1882; vol. 15, April, 1883; vol. 17, Sept.–Dec., 1884; vol. 19, April, 1886; vol. 21, June, 1889; vol. 25, Feb. August, 1893.

Canadian Journal of Medical Science, vol. 4, 1879, August; vol. 5, 1880, Feb. March, Dec.; vol. 6, 1881, April.

Canadian Practitioner, vol. 13, 1888, Oct.–Dec.; vol. 16, 1891, Feb., April, July; vol. 17, 1892, Feb., Sept.

Chicago Medical Journal, vol. 24, 1867, March, April, May, Sept.; vol. 25, 1868, Jan., August; vol. 32, 1875, August-Dec.

Cleveland Medical Gazette, vol. 5, 1890, Nov., Dec., 1889, Feb., August, 1890.

College and Clinical Record, vol. 1, 1880, August and Dec.; vol. 3, 1882, March, Oct., Nov.; vol. 4, 1883, Sept.–Nov.; vol. 5, 1884, Oct.

Daniels' Texas Medical Journal, vol. 4, 1889, May.

Druggists' Circular, vol. 24, 1880, Jan. and August; vol. 29, 1885, May and June; vol. 35, 1891, Feb. and April.

Gaillard's Medical Journal, vol. 29, 1880, March–June; vol. 30, 1880, July and August.

Hahnemannian, vol. 23, 1888, Jan.

Journal of Nervous and Mental Diseases, new series, vol. 14, 1889, May; vol. 15, 1890, May; vol. 17, 1892, Oct.–Dec.

Medical Brief, vol. 18, 1890, July and Nov.; vol. 22, 1894, Oct.

Medical Bulletin, vol. 16, 1894, July.

Medical Counselor, vol. 12, 1888, Sept; vol. 14, 1889, Dec.

Medical Missionary Record, vol. 2, 1887, Oct.; vol. 7, 1892, Dec.; vol. 8, 1893, Sept.; vol. 9, 1894, Oct.

Medical News, Philadelphia, vol. 52, 1888, Nos. 2, 10, 13, 14, 22, 24; vol. 53, 1888, Nos. 2, 7 and 8; vol. 55, 1889, No. 1; vol. 61, 1892, No. 27.

Medical Record, N.Y., vol. 34, 1888, Nos. 23, 24; vol. 35, 1889, No. 21; vol. 37, 1890, Nos. 21, 22, 23, 25, 26; vol. 38, 1890, Nos. 3, 4, 6; vol. 43, 1893, No. 5.

Medical World, vol. 11, 1893, Feb.; vol. 12, 1894, Nov.

Montreal Medical Journal, vol. 21, 1893, May.

New York Medical Times, vol. 21, 1893, Oct.–Dec.; vol. 22, 1894, Jan.

New Orleans Medical and Surgical Journal, vol. 17, 1890, March.

North American Journal of Homeopathy, vol. 41, 1893, August.

Obstetric Gazette, Cincinnati, Ohio, vol. 1, 1878, August.

Pacific Medical Journal, vol. 23, 1881, Oct.; vol. 32, 1889, May.

Peninsular Journal of Medicine, vol. 5, 1858, May, August, Oct., Dec.; vol. 9, 1873, Jan., June.

Physician and Surgeon, Ann Arbor, Mich., vol. 2, 1880, Dec.; vol. 16, 1894, Jan., May, August, Dec.

Practitioner, vol. 43, 1889, Dec.; vol. 47, 1891, Sept.

Quarterly Journal of Psychological Medicine, vol. 5, 1871, April, July.

Richmond and Louisville Medical Journal, vol. 12, 1871, July, August, Oct.–Dec.; vol. 16, 1873, July–Sept.; vol. 24, 1877, Dec.; vol. 25, 1878, June; vol. 26, 1878, July; vol. 28, 1879, Nov., Dec.

St. Louis Courier of Medicine, vol. 1, 1879, April, June; vol. 3, 1880, Jan., Feb.; vol. 5, 1881, Feb., May; vol. 6, 1881, July; vol. 7, 1882, March; vol. 9, 1883, Jan.; vol. 10, 1883, August, Dec.; vol. 11, 1884, Feb., April, May; vol. 18, 1887, Nov.

Southern California Practitioner, vol 1, 1886, Jan., Nov., Dec.; vol. 8, 1893, May; vol. 9, 1894, Jan., Feb., July, August.

Southern Practitioner, vol. 15, 1893, August, Oct.

Pasteur's Remains have been removed to the chapel built to receive them in the Institut Pasteur.

Frequency of Death from Pulmonary Tuberculosis after Amputations.—Marie has found so many cases of death from this cause that he is inclined to consider it more than a coincidence, and asks whether it can be due to the diminished resistance of the vitality after the amputation. He suggests that this possibility be borne in mind and statistics collected to decide the question.—*Presse Méd.*, December 12.

A Joy to its Friends and a Terror to its Foes.—A journal that gladdens the heart and delights the understanding every month is the *Texas Medical Journal*, Austin, Texas, otherwise known as the "*Red Back.*" As Chimmie Fadden would say, "it is up to de limit." Standing for the ethical in both medicine and journalism, it is the uncompromising foe to the medical pretender and adventurer. It is a joy to its friends and a terror to its enemies; *suaviter in modo, fortiter in re.* There is but

Texas Medical Journal, and Brother Daniel is the editor hereof. May its vigor never perish, nor its complexion fade. *Atlanta Medical and Surgical Journal*, January, 1897.

Roosevelt Hospital, New York City.—The trustees have recently opened for private patients a new pavilion, which has been erected west of the main building of the institution. It is designed for the treatment of surgical, gynecologic and medical cases under the most approved conditions, and care has been taken to fit up the rooms in such a manner as to render them homelike, cheerful and attractive. The first two floors of the pavilion are arranged to accommodate patients in single rooms or *en suite*, and the third and fourth floors have been set apart and furnished as a home for nurses, thus providing accommodations for the training school just opened.

The New York College of Physicians and Surgeons.—The College of Physicians and Surgeons will profit by the proposed new gymnasium for Columbia University. That institution will soon begin building one of the largest and best gymnasiums in the country. It is to be included in what will be known as the University Building, which will stand near the center of the new grounds on Morningside Heights. This structure, which is to be three stories in height, will be 260 feet long and 180 feet wide. In the basement there will be a magnificent swimming pool, said to be the largest of its kind in the world, and around it will be ranged all kinds of baths. On the main floor will be the gymnasium proper, with rooms on either side for boxing, fencing and other exercises, and with a running track extending all around it. The latter will be one-tenth of a mile long and twelve feet in width. The estimated cost of the building is $500,000.

The Economics of Pasteur's Discoveries.—One aspect of Pasteur's work is generally overlooked—his immense additions to the wealth of Europe, through the prevention of deaths among animals. Huxley said that the saving of animals in France alone was enough to pay the enormous indemnity demanded by Germany. Last spring a paper was presented to the French Académie de Médecine, by M. Hutrya of Budapest, describing some of the epidemics that have destroyed legions of cattle and sheep by anthrax, and myriads of hogs by swine disease in Hungary. Recently vaccinatians against these diseases have been introduced. In 1894, 110,789 cattle were vaccinated, and the death rate among them, which had previously been 5 per cent., went down to 0.0024. Also, 224,684 sheep were treated. The death rate among these had been 10 per cent., and it went down to 0.32. We have read lately of great losses in the West from some disease among hogs; whether it is identical with what is known as swine disease in Hungary is not known; but in the latter country in 1894, 681,118 hogs were vaccinated, and the death rate went down from the 20 per cent. of relatively good years to 0.28.

State Care of the Insane in New York.—It is claimed by the State Commission in Lunacy that a saving of more than $1,000,000 annually will result under the operation of the law providing for the State care of the insane. Under this law about $5,000,000 is expended each year through the supervision of the Commission for the operation and maintenance of the ten State Hospitals and their 19,000 inmates. All the State hospitals are now completed with the exception of those in New York and Brooklyn. A contract aggregating $350,000 for a group of buildings in connection with the Long Island State Hospital in Brooklyn has just been awarded. There are 2,500 dependent insane in Kings County. The commission has under way plans for the expenditure of $750,000 for new buildings for the Manhattan State Hospital, in New York city. The legislature, however, has not yet made a good portion of this amount available. There are 7,000 insane in New York city, a large number being taken care of in the old structures on Hart's Island. New buildings are to be erected for these insane as soon as possible. The system of caring for the insane wholly by the State has been in operation since March 1, 1896, when the County of New York transferred its insane and its property to the State. The year previous the County of Kings surrendered the control of its insane, with its property, to the State. In 1890 the transfer of the insane from the county poorhouse began. At this time there were 2,200 out of about eight thousand registered insane in the poorhouses, exclusive of those in the counties of New York and Kings. All of the insane are now receiving the beneficent care provided by the State. The private asylums in the State take care of more than one thousand insane persons. The number of private institutions is not increasing under the new law.

Cincinnati.

THE MORTALITY REPORT for the week ending January 22 shows: Deaths from all causes, 132; stillbirths, 3; annual rate per thousand population, 16.94; zymotic, 13; phthisis pulmonalis, 22; other constitutional, 13; local, 63; developmental, 13; violence, 8; preceding week, 145; corresponding week 1895, 125; 1894, 108.

THE OBSTETRICAL SOCIETY held its annual meeting January 21 and elected the following officers: President, Dr. Charles L. Bonifield; vice-president, Dr. C. B. Schoolfield; secretary, Dr. E. S. McKee; treasurer, Dr. Geo. E. Jones.

THE CONNER SURGICAL SOCIETY of the Medical College of Ohio held their first smoker and banquet January 23 at Lancet Hall and the affair was in every way a success. The membership of the society consists of the faculty and students of the Medical Department of the Cincinnati University.

THE WALNUT HILLS MEDICAL SOCIETY held its annual meeting at the Cincinnati Club January 21. The following officers were elected: President, Dr. Edward Ricketts; vice-president, Dr. Edward Shields; secretary and treasurer, Dr. O. W. Stark.

Philadelphia.

THE COLLEGE OF PHYSICIANS at its annual meeting, held January 6, reëlected Prof. J. M. DaCosta president and Dr. Thos. R. Neilson secretary. The president reported the clinical history of a case of hemiplegia from acute lead poisoning, in a woman 35 years of age, caused by exposure to the effluvia of fresh paint. Lead was detected in the urine, which was free from albumin and from sugar. Recovery followed treatment by iodid of potassium and massage with faradism of the muscles. Strychnia was substituted for the iodid, when improvement was marked. Dr. D. D. Stewart exhibited a specimen of large innominate aneurysm cured by the use of gold wire and galvanism, and claimed special advantage from combining the use of a weak galvanic current with the use of the wire for treating otherwise inoperable cases. The patient's condition, for months, had been rendered more comfortable, so that he could walk about the streets, and there was complete relief from former pain. The aneurysm was filled with a firm clot. Death was due to intercurrent disease (apoplexy) which was not connected with the aneurysm nor the operation. Dr. J. M. Anders read a "Memoir of the late Dr. Earnest Goodman." Dr. H. A. Hare read a brief communication on the effect of chloroform on the circulation, in which he especially spoke of the prompt fall in blood-pressure shown in experiments upon dogs, after beginning the inhalation of chloroform, which he had formerly attributed to heart failure. It was found, however, that by compressing the abdominal vessels so as to raise the arterial tension, the heart would resume its contractions. He now explains the cause of sudden death during chloroform narcosis as a vaso-motor phenomenon; the chloroform, acting upon the vaso-motor centers in the medulla, causes dilatation of the veins and fall of arterial tension, all the blood in the body being emptied into the veins. Therefore remedies to increase arterial tension should be resorted to, with compression of the abdominal aorta in cases of sudden asphyxia. Fatal results from the use of chloroform do not occur in parturient women, because the pains stimulate the vaso-motor

center and counteract the depressing influence of the anesthetic. It is also a comparatively safe agent to use in the case of children, as young hearts bear it better than old ones. The last paper was one by Dr. Stengel on "Auscultatory Percussion."

THE PHILADELPHIA PEDIATRIC SOCIETY held its first meeting after organization, January 12, Dr. J. P. Crozer Griffith, President, in the Chair. A case of neuritis occurring in a boy during the treatment of chorea with Fowler's solution, was exhibited by Dr. Stengel. A case of progressive neural atrophy beginning in the calf muscles (the peroneal form described by Charcot) was shown by Dr. C. S. Potts. Three cases of cretinism in patients under 12 years of age were shown by Dr. H. B. Carpenter and Dr. M. H. Fussell. All of them were said to be improving under the effects of extract of thyroid gland.

Dr. JAMES TYSON was elected president of the Philadelphia County Medical Society at its last meeting.

AT THE ANNUAL meeting of the Alumni Association of Jefferson Medical College, held January 9, Dr. H. G. McCormick of Williamsport, Pa., was elected president for the ensuing year. Resolutions were adopted relating to the deaths of Prof. Wm. H. Pancoast and Dr. James Graham. An appropriation of $200 was made toward equipping the pathologic laboratories.

Washington.

HEALTH OF THE DISTRICT.— Dr. J. E. Walsh, medical sanitary inspector of the health department, who has had charge of the contagious disease branch of the service, is himself a victim of diphtheria.

TO REGULATE THE SALE OF POISONS.—A bill to prevent the sale of poisons in the District of Columbia was introduced in the House on the 18th inst. by Mr. McCormick of New York. This declares it shall be unlawful for any but a regular pharmacist, or some one under his direct supervision, to sell certain poisons, enumerated in two separate schedules. When sold by pharmacists these articles must be in triangular bottles and labeled "poison." The purchaser must also be informed of the nature of the poison, and must show that he wants it for legitimate purposes. A book, in which these sales are recorded, must always be kept open for inspection. The penalty provided is a fine of not less than $5 nor more than $50.

MEDICAL SUPERVISORS' FIRST MEETING.—On the 14th inst. the first meeting of the Board of Medical Supervisors was held for the examination of persons who want to practice medicine and surgery in the District. Dr. Kleinschmidt, president; Dr. Woodward, secretary, and the other members of the board were present. Three candidates were examined. Under the law establishing the board all graduates who desire to practice medicine have to undergo an examination. This applies to all persons who had not registered previous to June 6.

TO RESTRICT VIVISECTION.—Senator Gallinger has by request submitted to the Senate letters from various distinguished men throughout the country in favor of the bill for restricting vivisection in the District of Columbia.

INTERNATIONAL ANIMAL QUARANTINE.—The agreement between the Secretary of Agriculture and the Canadian Minister of Agriculture relative to the quarantine of animals passing from one country to another, provides that each country shall accept the veterinary certificate of the other as final, and that they shall keep each other informed of any outbreaks of contagious disease; that a quarantine of from ninety to fifteen days shall be imposed upon cattle or ruminants, or swine coming from European countries in which pleuro pneumonia or foot-and-mouth disease exist; that breeding cattle shall have certificates of freedom from tuberculosis, or submit to a week's quarantine, and cattle from feeding or stock ranches must have certificates of freedom from diseases of all kinds. Sheep may be admitted subject to inspection and slaughter if disease appears. They are also accorded privileges of passage in bond through ports without inspection. Swine for slaughter may pass without inspection to bonded slaughter houses, or when properly certified as part of a settler's effects. Liberal rules are laid down for the entry of horses into either country, and particularly for those belonging to Indian tribes and travelers.

ANTHROPOLOGICAL SOCIETY'S OFFICERS.—At the annual election of the Anthropological Society, recently held, the following officers were elected for the year; President, Dr. Frank Baker; vice-presidents, Prof. W. J. McGee, Mr. George R. Stetson, Gen. George M. Sternberg and Dr. Cyrus Adler; general secretary, Dr. J. H. McCormick.

THE OLEOMARGARIN BILL PASSES THE HOUSE.—The oleomargarin bill passed the House on the 14th inst. The full text of the bill is as follows: "That all articles known as oleomargarin, butterin, imitation butter or imitation cheese, or any substance in the semblance of butter or cheese not the usual product of the dairy and not made exclusively of pure and unadulterated milk or cream, transported into any State or Territory, or remaining therein for use, consumption, sale or storage therein, shall, upon arrival in such State or Territory, be subject to the operation and effect of the laws of such State or Territory enacted in the exercise of its police powers to the same extent and in the same manner as though such articles or substances had been produced in such State or Territory, and shall not be exempt therefrom by reason of being introduced therein in original packages or otherwise: Provided, that nothing in this act shall be construed to permit any State to forbid the sale of oleomargarin except in such a manner as will advise the customer of its real character."

MEDICAL SOCIETY.—At the regular meeting of the Medical Society held on the 20th inst. Dr. Bishop read a paper entitled "Some Physical and Therapeutic Facts on Static Electricity." Dr. L. W. Richardson reported a case of laryngectomy, and presented the specimen. Dr. Burnett presented pathologic specimens of gumma of the ciliary region and a phlebolith of the conjunctival veins.

THIRD TRI-ANNUAL MEETING OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.—Dr. S. S. Adams, chairman of the Committee of Arrangements of the Third Tri-annual Congress, called a meeting of the committee on the 21st inst. The congress will meet on May 4, 5 and 6 next at the Columbia Theater, Washington, D. C. Important business matters for the coming event were transacted. The members of the committee present were Drs. S. S. Adams, W. N. Johnston, S. O. Richey, G. M. Sternberg, Shands and Frank Baker from Washington and Drs. Meak, Tiffany, Atchison and Theobald of Baltimore, Md.

THE PUBLIC SERVICE.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending Jan. 23, 1897.

Asst. Surgeon H. LaMotte, detached from treatment at naval hospital, Philadelphia, and ordered before retiring board at Washington Jan. 26, then home and placed on waiting orders.

Change of Address.

Beach, S. C. from Chicago, Ill., to McCook, Neb.; Bazan, F., from 415 Sutter St. to 776 Geary St., San Francisco, Cal.; Berg, O. H., from Carpenter and Milwaukee Ave. to 547 N. California Ave., Chicago, Ill.

Dal, J. W., from 860 to 482 Milwaukee Ave., Chicago, Ill.

Lincoln, D. T., from Geneva, N. Y., to 73 Pinckney St., Boston, Mass.; Lau, O. H., from 1356 Woodward Ave. to 25 Piquette Ave., Detroit, Mich.

Stover, G. H., from Eaton to Fort Collins, Colo.

Westervelt, J. D., Jr., from Alice to Dallas, Texas, care Jeff House's Drug Store; Wilmarth, A. W., from State Hospital for the Insane, Norristown, Pa., to State Home for the Feeble Minded, Chippewa Falls, Wis.

LETTERS RECEIVED

Anderson, Winslow, San Francisco, Cal.; Alma Sanitarium Co., Alma, Mich.

Betz, F. S., Kelly & Co., Chicago, Ill.; Bridgham, S. C., Scituate Center, Mass.; Buckmaster, S. P., Hudson, Wis.; Birch, T. J., Port Carbon, Pa.; Bowne, E. H., Kingston, N. J.; Bourland, Will, Earls, Ky.

Cleborne, R. K., Locust Point, Baltimore, Md.; Cohen, I. N., LaCrosse, Wis.; Chambers, J. H. & Co., (2) St. Louis, Mo.; Chilgren, G. A., St. Peter, Minn.; Cook, G. H., Paris, Texas.

Dennis, W. A., St. Paul, Minn.; Daniel, Z. T., Carlisle, Pa.; Dial, E. A., (2) San Luis Obispo, Cal.; Devlin, J. B., Denver, Colo.; Dillingham's, E. B., Advertising Agency, Hartford, Conn.; Douglas, Richard, Nashville, Tenn.; Davis, W. H., San Bernardino, Cal.

Ekern, A., Grand Forks, N. D.; Eshner, A. A., Philadelphia, Pa.; Eisner & Mendelson Co., New York, N. Y.

Fitch, W. E., Durham, N. C.; Ford, Rochester, Tucson, Ariz.; Fleming, J. H., Joplin, Mo.; Friernood, E. K., Greentown, Ind.; Fuller's, Chas. H., Advertising Agency, Chicago, Ill.; Fougera, E. & Co., New York, N. Y.; Fite, C. C., New York, N. Y.; Fort Wayne Medical Journal-Magazine, Fort Wayne, Ind.; Farber, James H., Dayton, Ohio.

Gryttenholm, K., Zumbrota, Minn.; Gardner, R. W., New York, N. Y. Hertz, E. F., Minneapolis, Minn.

Imperial Granum Co., New Haven, Conn.; Ingals, E. Fletcher, Chicago, Ill.

Jonas, A. F., Omaha, Neb.; Jones, D. N., Gaylord, Minn.

Knudson, T. J., Chicago, Ill.

Love, J. J. H., Montclair, N. J.; Londonderry Lithia Spring Water Co., Nashua, N. H.; Law, A. R., Madison, Wis.; Laughlin, E. D., Orleans, Ind.; Larrabee, J. A., Louisville, Ky.

Mogk, Wm. A., Ann Arbor, Mich.; Merrick, M. B., Passaic, N. J.; Moore, D. L., (2) Columbus, Ohio; Mark, A. A., New York, N. Y.; Mathews, J. M., Louisville, Ky.; Moss, Robert H., Niagara, Ky.

Nicholson, Geo. T., Chicago, Ill.; Naar, Day & Naar, Trenton, N. J.; Noer, J., Stoughton, Wis.

Pressy, A. J., Grand Rapids, Mich.; Patch, Wm., Sibley, Ill.; Palmer, O. W., Spaulding, Neb.; Poorman, Warren M., New York, N. Y.

Rutledge & Hobart, Grand Forks, N. D.; Rochelle, W. F., Jackson, Tenn.; Reilly & Ritchie, Appleton, Wis.; Richter Bros., Milwaukee, Wis.; Robbins, Charles Pern, Winona, Minn.

Smiley, T. B., Mt. Vernon, S. D.; St. Peter State Hospital, St. Peter, Minn.; Shoemaker, F., Ft. Sill, Oklahoma Territory; Scott, E. C., Maxwell, Iowa; Slocum, Charles E., Defiance, Ohio.

Walker, J. W., Hospital, Ill.; Wright, J. P., St. Louis, Mo.; Willard, F. W., Anna, Ills.; Wells, W. A., Washington, D. C.

Zenner, Philip, Cincinnati, Ohio.